91W10
Advanced Individual Training Course

Combat Trauma Treatment and Management Handbook

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Appendix A – Treat a Casualty with a Spine Injury, Competency Skill Sheets

Appendix B – Treat a Casualty with a Chest Injury, Competency Skill Sheets

TERMINAL LEARNING OBJECTIVE

Determine the type, nature and extent of injuries and initiate appropriate treatments to stabilize the casualty and prepare them for evacuation.

Introduction to ballistic, blasts, and burns injuries

Medical personnel

(1) Historically ignored weaponry believing that this knowledge had little relevance to being able to perform their job
(2) Believed in some way conflicted with the status accorded medical personnel under the Geneva Hague treaties

Medical personnel should know how weapons are used and understand their effects on the human body

(1) Medical personnel are required to protect and defend the lives of their patients
(2) Medical personnel will be better able to treat the casualties that they encounter
(3) Enables medical personnel to more accurately predict the number and type of casualties that may result from a combat action so that adequate medical support can be arranged
(4) Can lead to development of countermeasures and protective equipment

Three types of wounding agents common to all weapons systems employed in conventional warfare

(1) Projectiles (bullets) that are fired from small arms
(2) Primary and secondary missiles created by explosive munitions
(3) Flame and incendiary chemicals used in incendiary munitions

Identify small arms, wounding agents and their effects

Small arms:

Individual or crew served weapons (pistols, rifles, and machine guns) that fire solid projectiles, which have a diameter of 20mm or less

The trend in small arms development weapons capable of generating multiple casualties either by firing more rounds or improved munitions, which will generate multiple casualties per round, fired.

The rationale:

(1) If a casualty receives multiple random wounds from a weapon, the likelihood that a critical organ will be injured is greater than if the victim were hit with only one projectile
(2) Weapons that cause multiple wounds require an opponent to use more resources and personnel to treat and evacuate their casualties

Small arms designs commonly found in use today

(1) Pistols: weapons that may be employed using one or both hands. The ammunition used in pistols is of relatively low velocity and modest lethality.
(2) Submachine guns: shoulder fired weapons designed to be fired in either a semi or fully automatic fire mode. They use pistol caliber ammunition and are usually issued to specialized personnel.
(3) Shotguns: shoulder fired, pump action or semiautomatic weapons which discharge multiple spherical shot or flechette projectiles with each round fired
(4) Assault rifles: shoulder fired weapons that are capable of semi or fully automatic fire (e.g. M-16A2, AK-47). Principle weapon of infantry forces and snipers.
(5) Machine guns: fully automatic, individual or crew served weapons used to suppress enemy fire rather than hit specific targets. Three categories of machine guns:
    (a) Light (e.g. M-249 Squad Automatic Weapon, SAW)
    (b) General purpose (e.g. M-60 General Purpose Machine Gun, GPMG)
    (c) Heavy (e.g. M-2 Heavy barrel .50 cal Machine Gun, HMG)

Wound causing agent from small arms fire is the projectile or bullet, which is discharged when the weapon is fired.

Severity of wounds is dependent on several factors:

(1) Caliber (size)
(2) Shape
(3) Design and construction
(4) Weight
(5) Velocity
(6) Type of tissue struck or impacted
(7) Fragmentation of the projectile

As a bullet passes through body tissue it produces two mechanisms of wounding.

(1) A permanent cavity that is created as a bullet penetrates through and crushes the tissue in its path
(2) A temporary cavity which is a stretching of the surrounding tissues that is created as the energy of the bullet is released into the surrounding tissues ahead of the bullet via a sonic shock wave and hydrostatic energy that is created

Wounds and complications of wounds resulting from small arms may be manifest in a variety of ways, for example:

(1) Simple penetrating wounds
(2) Through penetrating wounds with disproportionately large exit wounds
(3) Fractures, amputations and massive soft tissue injuries when extremities are involved
(4) Eviscerations and evacuation of body cavities

(5) Massive soft tissue and internal organ injuries
(6) Severe blood loss, shock and death

Emergency medical care for small arms wounds is essentially the same as for any other form of trauma and revolves around the soldier medic Core Skills

(1) Airway
(2) Breathing
(3) Circulation (Bleeding is controlled)
(4) Shock is prevented or treated appropriately (I.V. therapy is initiated if appropriate)
(5) Evacuation is accomplished in a timely manner (Ongoing care is provided en-route)

Identify explosive munitions, wounding agents and their effects

Explosive munitions:
Consist of explosive projectiles and other explosive devices such as bombs, rockets, grenades, and mines that are fired from ordnance (e.g. Artillery pieces and cannons), dropped from aircraft, launched (e.g. Multiple Launch Rocket System), thrown, or planted in order to cripple or destroy personnel and equipment

The generic prototype of the exploding munition is the shell

Two basic types of exploding

(1) Antipersonnel exploding munitions: most commonly encountered in the form of grenades, rockets, bombs, and mines. They fall into two classifications:
    (a) Random-Fragmentation munitions are munitions where the shell casing splinters unpredictably, and the resulting fragments vary in size, shape and velocity
    (b) Improved-Fragmentation munitions are munitions where the casing is made of a fragmented material that breaks up in a more controlled fashion or they are filled with preformed fragments, which disperse in a much more evenly in the target area
(2) Antimaterial munitions that have antipersonnel effects
    (a) Kinetic-Energy Antimaterial Warheads (e.g. The Armor Piercing Fin Stabilized Discarding Sabot fired by tanks), these munitions rely on the speed and the density of the projectile to disable or destroy the target. The principle injuring mechanisms of the kinetic energy warhead to personnel are:
        (i) The penetrator (Projectile)
        (ii) Fragments from the target when struck
        (iii) Secondary fires
    (b) Explosive Antimaterial Warheads (e.g. Light Anti-tank Weapon LAW, Anti-tank 4 rocket AT4) are most commonly found in the form of a shaped charge or hollow charge

warhead. The principle wounding agents from these weapons are:
(i) Fragments from the casing and or target
(ii) Blast
(iii) Flame
(iv) Secondary fires

The principle injuring mechanisms of these weapons are caused by a complicated mix of ballistic, blast, and burn injuries.

The type and severity of wounds sustained is primarily dependent on the casualties' distance from the epicenter of the explosion.

(1) Casualties close to the epicenter of the explosion are likely to suffer from all three wound-causing agents of the munition
(2) Those casualties who sustain wounds from all three wound-causing agents usually suffer from mutilating blast injury and are not likely to survive
(3) Those casualties who are farther away from the epicenter are l kely to experience a combination of blast from the explosion and penetrating trauma from primary and secondary missiles created by the explosion

Wounds and complications of wounds resulting from explosive munitions

(1) Ballistic injuries sustained from the primary and secondary missiles created by exploding munitions are in principle the same type of ballistic injuries sustained from small arms fire. However, the size of the projectile str king the casualty may be considerably larger and the injuries sustained will be proportional in nature.
  (a) The nature and extent of ballistic injuries generated by explosive munitions will vary considerably. Examples of factors, which influence these, are:
    (i) Proximity to the explosion
    (ii) Size and shape of the missile or fragment
    (iii) Velocity of the missile or fragment
    (iv) Tissue struck
  (a) Primary blast injury: due solely to the direst effects of the pressure wave on the body. The injury from the primary blast is seen almost exclusively in the gas containing organs of the body, with injury to the lungs causing the greatest morbidity and mortality.
  (b) Secondary blast injury: occurs from penetrating or nonpenetrating injury caused by ordinance projectiles or secondary missiles, which are energized by the explosion and str ke the victim
  (c) Tertiary blast injury: results from whole body displacement and subsequent traumatic impact with environmental objects (Trees, buildings, vehicles, etc.)
  (d) Other indirect effects include crush injury from collapse of structures and toxic effects from inhalation of combustion gases

Burn injuries

From explosive munitions are the result of heat and flame generated by the detonation of the explosive filler material in the munition casing and secondary fires started on the target. They usually occur when the casualty is at the epicenter of the explosion or the target is burning. The further the distance from the explosion the less likely that burns will be suffered from the explosion.

Identify flame and incendiary munitions, their agents and their effects

Flame, incendiary, and phosphorus-containing munitions are weapons that use a combustible material source to expel people from strongholds or hidden positions and destroy material

Although flame and incendiary munitions theoretically constitute separate classes of weapons, they both use fire as the means to achieve the objectives of the user

The fear of being burned is the crucial incapacitating factor in the effectiveness of these weapons

Flame and incendiary munitions and their means of delivery

(1) Flame munitions
  (a) Areal delivered such as Napalm bombs
  (b) Flame throwers
  (c) Rocket launched warheads
(2) Incendiary weapons
  (a) Areal delivered bombs
  (b) Grenades
(3) Phosphorus-containing munitions
  (a) Areal delivered bombs
  (b) Artillery shells
  (c) Grenades
  (d) Phosphorus ignites spontaneously in air at 111.2 degrees Fahrenheit
  (e) Burns at 1,472 degrees Fahrenheit
  (f) Will continue to burn until it is deprived of air and the continued presence of Phosphorus on the skin results in dermal penetration and tissue necrosis.

The wounding agent for all flame, incendiary, and phosphorus-containing munitions is the intense heat and fires that they generate and from fumes produced by the fires Injuries and complications of injuries produced by flame, incendiary, or phosphorus-containing munitions.

(1) First degree burns
(2) Second degree burns
(3) Third degree burns
(4) Smoke inhalation

Identify the medical implications of conventional weapons

The weapons of conventional land warfare are designed to inflict physical harm on personnel by wounding with bullets or fragments, damaging internal organs with blast effects or burns.

Military medical personnel must be adequately prepared to treat all of these types of injury.

Ballistic injuries

Most casualties in modern conventional hostilities are by weapons that cause ballistic wounds. Although the severity the wound depends to some extent on the nature of the projectile or fragment the most important factor in a ballistic injury is the anatomical site hit.

Blast injuries

May not be obvious to medical personnel.
As weapons increasingly take advantage of the physical properties of blast waves, medical personnel should be aware that a blast injury may be present in a casualty whose only overt injuries are the more immediately threatening blunt, penetrating or thermal trauma.

Burns

Responsible for relatively few casualties in conventional warfare
Can be so disfiguring and painful
Have serious psychological implications for both combat and medical personnel, as well as intensive medical-resource allocation requirements.

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked M5 Bag or Combat Medic Vest System, oxygen, suction and ventilation equipment (if available), and documentation forms. You encounter a casualty with a burn injury. The casualty has been assessed and injury(ies) prioritized. The casualty's airway has been established. The types of burn agents are unknown.

Stabilized the associated effects of the burned casualty for prevention of respiratory compromise, shock, pain, and for protection of wounds.

Recognize the mechanism of injury and eliminate the source of a burn

The source of the burn must be eliminated before any evaluation or treatment of the casualty can occur

Thermal burns

(1) If the casualty's clothing is on fire, cover the casualty with a field jacket or any large piece of nonsynthetic material and roll him or her on the ground to put out the flames. All clothing should be removed.

Chemical burns

(1) Remove liquid chemicals from the burned casualty by flushing with as much water or other nonflammable fluid as possible

(2) Remove dry chemicals by carefully brushing them off with a clean, dry cloth. If large amounts of water are available, flush the area. Otherwise, apply no water. Small amounts of water applied to a dry chemical burn may cause a chemical reaction, transforming the dry chemical into an active burning substance.

(3) Smother burning white phosphorus with water, a wet cloth, or wet mud; keep the area covered with the wet material to exclude air and to prevent the particles from burning

Electrical burns

(1) If the casualty is in contact with an electrical source, turn the electricity off if the switch is nearby. If the electricity cannot be turned off, drag the casualty away from the source using any nonconductive material (rope, clothing, or dry wood). Do not touch the casualty or the electrical source with bare hands.

(a) Electrical Currents

(i) Alternating Current (AC) - is a range that includes house current in most locales and tends to cause ventricular fibrillation if the pathway includes the heart

(ii) Direct Current (DC) - is much less dangerous than AC; however, electrochemical skin burns have been reported from DC current

Inhalation injuries

(1) Classified as carbon monoxide poisoning, heat or smoke inhalation injuries

(2) These injuries account for more than half of the 12,000 burn-related deaths per year

Laser burns

(1) Move the casualty away from the source while avoiding eye contact with the beam source. Be careful not to view or walk into the beam or you may become a casualty.

(2) Never look at the beam source, and if possible, wear appropriate eye protection. Sources of laser beams include range finders, weapons guidance systems, communication systems, and weapons simulations.

Assess the severity of the burn

Initial evaluation of a burn patient

(1) Depth of burn
(2) Extent of burn
(3) Age of the patient
(4) Pulmonary injury
(5) Associated trauma
(6) Special considerations- electrical, chemical
(7) Preexisting illnesses

Depth of burn

(1) First degree - minor tissue damage to the outer epidermal layer only, causing an intense and painful inflammatory response
   (a) Various medications used to help speed healing and reduce the painful inflammatory response
   (b) Also descr bed as a superficial burn because there are layers of skin cells left that can multiply with resultant healing
      (i) Cause -minor flash or sun
      (ii) Skin color -red
      (iii) Skin surface -no blisters and dry
      (iv) Sensation -painful
      (v) Healing -3 to 6 days

(2) Second degree -may cause damage through the epidermis and into a variable depth of the dermis
   (a) Burns will normally heal without scaring
   (b) Treatment includes ant biotic creams or various specialized types of dressings
   (c) Provide appropriate medical evaluation and care for these patients
   (d) Also descr bed as a partial thickness burns because there are layers of skin cells left that can multiply with resultant healing
      (i) Cause -flashes, flame, or hot liquids
      (ii) Skin color - mottled red
      (iii) Skin surface -blisters with weeping
      (iv) Sensation painful

(v) Significant fluid loss and subsequent shock may occur
(vi) Healing -depending on depth, 2 to 4 weeks

(3) Third degree - damage to all layers of the epidermis and dermis
(a) There are no layers of skin cells left
(b) Healing is impossible except in small third-degree burns that usually scar in from the sides
(c) All third-degree burns leave scars
(d) Deeper third-degree burns usually result in skin protein becoming denatured and hard, leaving a firm leatherlike covering that is referred to as eschar
(e) All layers of skin are destroyed, no skin cells remaining to allowing healing
(f) Referred to as full thickness burn
(i) Cause -electricity, chemicals, hot metals and flame
(ii) Skin color - charred translucent and/or pearly white; parchment like
(iii) Skin surface - dry with thrombosed blood vessels
(iv) Sensation - anesthetic
(v) Healing - skin grafting required

(4) The severity of burn injuries depends on the depth and extent of the burn -management and initial care must concentrate on limiting progression of these two factors

Determine the extent of the burn

(1) Apply the rule of nines to the burn casualty to determine the percentage of body area burn in an adult
(a) Head and neck equals 9 percent
(b) Anterior trunk equals 18 percent
(c) Posterior trunk equals 18 percent
(d) Anterior upper extremities equal 9 percent
(e) Posterior upper extremities equals 9 percent
(f) Anterior lower extremities equal 18 percent
(g) Posterior lower extremities equal 18 percent
(h) Perineum (groin) equals 1 percent

Estimating scattered burns:

The patient's palm surface of the hand represents approximately one percent of his/her total body surface area (BSA).
Using the palmar surface as a guideline, even the extent of irregularly disposed burns can be estimated.

(2) Apply the rule of nines to the burn casualty to determine the percentage of body area burn in an infant/child
(a) Head and neck equals 18 percent
(b) Anterior trunk equals 18 percent
(c) Posterior trunk equals 18 percent
(d) Anterior upper extremities equal 9 percent

(e) Posterior upper extremities equals 9 percent
(f) Anterior lower extremities equal 14 percent
(g) Posterior lower extremities equal 14 percent
(h) Perineum (groin) equals 1 percent

The heads of infants and young children are larger in relationship to the rest of the body than adults and require a modification to the rules of nine in estimating the extent of burns.

Age of the patient
(1) Age has a significant impact on survival
(2) The very young and the very old respond poorly to burn injury

Pulmonary Injury
(1) Smoke inhalation accounts for over ½ of the burn deaths annually
(2) Most inhalation injuries are caused by smoke particles, carbon monoxide and toxic fume inhalation. These injuries are not immediate apparent.
(3) ALWAYS assume an inhalation injury in an enclosed space fire

Associated trauma
(1) Explosions and lightening may throw patients some distance from the original injury. Assess for related traumatic injury

Special considerations
(1) Electrical burns are usually more serious than they appear on the skin surface

Preexisting illnesses
(1) Chronic cardiac, pulmonary, renal or liver diseases have a negative impact on a patient's prognosis

Manage the casualty with thermal burns

First priority: remove the burn source

Dangers in removing the burn source:
(1) "Flash-over" - a sudden explosion into flames -temperature rising instantaneously to over 3,000 degrees. Removal of victims from burning buildings takes priority over all other objects in the environment- there is no warning for a flashover.
(2) Rescuers become victims of chemical burns because of the inability to note sources of caustic and toxic chemicals. All rescuers should be trained in hazardous materials management.
(3) Electrical wire is hazardous and dangerous. Unless you are trained to do so, DO NOT attempt to remove wires. Objects commonly felt to be safe, i.e., wooden sticks, manila rope, firefighters gloves, may not be protective and may result in electrocution. If at all possible, turn off the source of electricity before any rescue attempt is made.

Management of burns

(1) Primary Survey
- (a) A, B, C, D, E
- (b) Initiate IV hydration with large bore needle and Ringer's Lactate solution or Normal Saline
- (c) Fully expose the patient removing all clothing, watches and jewelry as combat situation dictates
- (d) Oxygen initiation, if available
- (e) Cardiac monitoring, if available

(2) Record the mechanism of injury, depth of burn, extent of burn, age of the patient, any associated pulmonary injury, preexisting illnesses and chemical/electrical details.

(3) Secondary survey
- (a) Continue evaluation of the burn
- (b) Estimate of the depth based on appearance
- (c) Rough calculation of the burn size by using the rule of nines
  - (i) The body is divided into areas that are assigned either 9% or 18% of total body sizes
  - (ii) By roughly drawing in the burned areas, the size can be estimated
  - (iii) Estimate the size, for smaller or irregular burns, using the surface of the victim's hand as about 1% of the total body surface area
- (d) Calculation of IV rehydration rates for burn patients
  - (i) The burn patient needs 2 to 4 ml. of Ringer's Lactate solution/Normal Saline per kg of body weight per percent of body surface burn in the first 24 hours to maintain blood volume and urinary output.
  - (ii) One-half of the total estimated fluid is infused in the first eight hours, the remainder of the fluid is infused over the next sixteen hours. Calculate as post burn requirements not after arrival at the BAS.
  - (iii) Calculate fluid requirements based on the time from injury, not from the time fluid resuscitation started
  - (iv) Example: 70 kg patient with 50% second degree burn
    4 ml X 70 kg X 50% = 14,000 ml of IV fluid/24 hr.
    7,000 ml of IV fluid/8 hr.
  - (v) As with all burn formulas, this is an estimate of fluid resuscitation

(4) Wound Care
- (a) Wrap patient's burns in a dry sterile dressing.
- (b) DO NOT apply ointments or solutions
- (c) DO NOT open blisters

(d) If hands or toes are burned, separate digits with sterile gauze pads. Moisten the pads with sterile water. Apply loosely. The hand should be in a position of function.
(e) Burns to the eyes - Do not open eyelids if they are burned. Be certain burn is thermal and not chemical. Apply moist sterile gauze pads to both eyes.

(5) Considerations
(a) Medications are rarely needed for the burn itself. Use extreme caution when administering pain medications – the status of associated injuries is unclear, and thus medication administration can be dangerous. When administering Morphine Sulfate, be aware of the indications and contraindications of this drug as they relate to burns.
(b) Tetanus - when in doubt administer

Manage the casualty with chemical burns

Countless types of chemicals can cause burn injuries
(1) Most chemical burns are caused by industrial sources of chemicals
(2) Most are caused by strong acids, bases (alkali), or organic compounds
(3) The fumes can cause inhalation burns
(4) The eyes may be involved

Signs and symptoms
(1) Reddening, blistering skin
(2) Pain (mild to intense)
(3) Obvious deterioration of skin
(4) Chemical odor

Chemicals not only injure the skin, but also may cause internal organ failure due to absorption
(1) Lung tissue damage through inhalation and subsequent life-threatening respiratory failure
(a) Frequently deceiving -initial skin changes may be minimal and burns may not be obvious
(b) Take precautions not to get these chemicals on yourself
(c) The pathologic process causing the tissue damage continues until the chemical is either consumed in the damage process or until it is removed
(2) Inactivation using neutralizing chemicals is dangerous because these neutralizing chemicals generate other chemical reactions that may worsen the injury

To remove the chemical:
(1) Wear protective gloves, eyewear, etc.
(2) Remove all clothing covered with chemicals
(3) Irrigate copiously, with any source of available water or other irrigant, to flush chemicals off the body

(4) Wipe or scrape any retained agent that sticks to the skin
(5) Continue flushing 15 minutes (unless a critical or unstable situation warrants transport sooner)
(6) Irreversible damage will occur in the eye quickly because of caustic chemicals -irrigate to prevent severe and permanent damage to the corneas
(7) During irrigation, remove contact lenses. Although soldiers will not generally be wearing contact lens, be aware of this precaution when treating aircrew members.
(8) Brush off dry chemicals on the skin before performing irrigation
(9) Chemical burns to the eyes
  (a) Immediately flood the eyes with water
  (b) Hold eyelids open; wash medial (nasal) to lateral
  (c) Wash for at least 20 minutes; transport while washing
  (d) Cover both eyes with moistened pads
  (e) DO NOT use neutralizers such as vinegar or baking soda
(10) PROTECT YOURSELF DURING THE WASHING PROCESS.

Manage the casualty with electrical burns

Electricity entering the body and traveling through the tissues causes tissue damage. Because of their small size, extremities usually have more significant tissue damage. This damage is due the higher local current density

(1) Severity of electrical injury is determined by:
  (a) The type and amount of current, path of the current, and duration of contact with the current
  (b) Immediate cardiac dysrhythmias are the most serious injury that occurs due to electrical contact. A careful, immediate evaluation of a patient's cardiac status and continuous monitoring of cardiac activity is necessary -the patient may initially appear to be stable
  (c) Common life threatening dysrhythmias are premature ventricular contractions, ventricular fibrillation and tachycardia fibrillation
    (i) Initiate aggressive advanced life support management of these dysrhythmias -these patients usually have normal healthy hearts and the chances for resuscitation are excellent
    (ii) Management for a patient in ventricular fibrillation with only basic life support available: Start cardiopulmonary resuscitation (CPR) and transport immediately to Level 3
    (iii) Provide field care as you would for thermal burns once the efforts at managing cardiac status are complete
  (d) Other electrical injuries include:
    (i) Skin burns at entrance and exit sites
    (ii) Surface flame burns (patient's clothing being ignited)

(iii) Dislocations and/or fractures (due to violent muscle contractions)
(iv) Internal injuries involving muscle damage and nerve damage

(e) The first priority at the scene of an electrical injury is to determine if the patient is still in contact with the electrical current
(i) If so, remove the patient from contact without becoming a victim yourself
(ii) Handling high-voltage electrical wires is extremely hazardous -special training and equipment are needed to deal with downed wires
(iii) Never attempt to move wires with makeshift equipment (pieces of wood, tree limbs, and manila rope may conduct high-voltage electricity)

(f) It is impossible initially to determine the total extent of the damage in electrical burns; all electrical burn patients should be transported to the nearest treatment facility

Causes

(1) Can be caused by high or low voltage
(2) Direct electrical current (deep injuries)
(3) Arc burns
(4) Lightning injuries (less deep injuries)
(a) People can be hit by lightning and survive.
(b) Usually briefly unconscious
(c) May develop arrhythmia or cardiac arrest
(d) Can be successfully resuscitated

Signs and symptoms

(1) They are burns where electrical energy enters and exits the body. A burn of exit wound is usually larger.
(2) Disrupted nerve pathways are displayed as paralysis
(3) Muscle tenderness, with or without twitching
(4) Respiratory difficulties or arrest
(5) Cardiac arrhythmia or arrest
(6) Elevated BP or low BP with signs of shock
(7) Restlessness or irritability
(8) Loss of consciousness
(9) Visual difficulties
(10) Fractured bones and dislocations from severe muscle contractions or from falling (can include spinal column)
(11) Seizures

Treatment and transport considerations

(1) Make certain that you and the patient are in a safe zone.

(a) DO NOT handle power lines unless you are certain the current is turned off
(b) If the patient is in contact with electricity, turn off the power before approaching him or her
(c) Power lines may have up to 50,000 volts. It is always safer to assume a fallen line is "alive."

(2) Open and maintain airway
(3) Provide basic cardiac life support as required. Use a cardiac monitor as soon as possible.
(4) Care for spinal injuries, head injuries, and severe fractures
(5) Evaluate the burn looking for the entrance and exit burn sites
(6) Remove clothing and assess the burn injury
(7) Apply dry, sterile dressings to the burn sites
(8) Care for shock and administer a high concentration of oxygen
(9) Initiate large bore IV access with IV running open- this will aid in preventing renal failure from muscle damage.
(10) Transport as soon as possible
(11) The major problems caused by electrical shock are usually not from the burn. Respiratory and cardiac arrest are real possibilities. Be prepared to provide basic cardiac life support measures.

Manage the casualty with inhalation burns

Inhalation injuries -classified as carbon monoxide poisoning, heat or smoke inhalation injuries.

These injuries account for more than half of the 12,000 burn-related deaths per year

(1) Asphyxiation and carbon monoxide poisoning -the most common cause of early death associated with burn injury
(2) A byproduct of combustion and is one of numerous chemicals in common smoke. Its presence is impossible to detect -odorless, colorless, and tasteless.
(3) Patients quickly become hypoxic (alteration in the level of consciousness is the most predominant sign of hypoxia)
(4) Treatment: high-flow oxygen by mask
(5) Begin basic life support ventilation using 100% oxygen if the patient has lost consciousness
(6) By having the patient breath fresh air, it will take up to seven hours to reduce the carbon monoxide-hemoglobin complex to a safe level - breathing 100% oxygen decreases this time to about 90- 120 minutes. Using hyperbaric oxygen (100% oxygen at 2.5 atmospheres) will decrease this time to about 30 minutes

Causes

(1) Can be caused from fumes or smoke in the air. You may not be able to smell the fumes!
(2) May be from stream
(3) The injury may be worse if inhalation occurred in a confined space

Signs and symptoms

(1) Difficulty breathing (dyspnea)
(2) Coughing, stridor
(3) Breath has "smoky" or "chemical" smell
(4) Black residue in patient's nose and mouth
(5) Nasal or facial hairs are singed
(6) There are burns to the head, the face, or the front of the trunk

Treatment measures

(1) Move the patient to a safe area
(2) Do an initial assessment and supply life support measures as needed
(3) Administer a high concentration of oxygen (humidified if possible) with a nonrebreather mask
(4) Care for possible spinal injuries and any other injury or illness requiring care at the scene
(5) Provide care for shock
(6) Stay alert for behavioral changes
(7) If difficulty breathing increases, prepare to intubate.

Transportation requirements

(1) Transport in a position of comfort if other injuries allow it
(2) Most conscious patients are able to breathe more easily when placed in an upright (seated) position

Assess for signs and symptoms of carbon monoxide poisoning

(1) Evaluate casualty's complains
    (a) Dizziness
    (b) Nausea
    (c) Headache
(2) Inspect casualty cherry-red colored skin and mucous membranes
(3) Assess casualty for tachycardia or tachypnea
(4) Monitor vital signs/airway

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked Combat Medic Vest System (CMVS) or fully stocked M5 Bag. Given a casualty with symptoms and findings consistent with heat injury. No other injuries were identified.

Recognize an environmental emergency

Environmental Emergency - a medical condition caused or exacerbated by the weather, terrain, atmospheric pressure, or other local factors

(1) Instances of environmental emergencies
(2) Environmental impact on morbidity and mortality
(3) Environmental factors that induce or exacerbate other medical or traumatic conditions

Risk Factors

(1) Age
(2) General health
(3) Fatigue
(4) Predisposing medical conditions
(5) Medications

Environmental Factors

(1) Climate
(2) Season
(3) Weather
(4) Atmospheric (barometric) pressure - the pressure exerted by the weight of the air. An increase in altitude decreases pressure.
(5) Terrain

Types of Environmental Injuries

(1) Cold injury
(2) Heat injuries
    (a) Heat Cramps
    (b) Heat Exhaustion
    (c) Heatstroke
(3) Localized injuries
    (a) Radiation burns, e.g., sunburn

Identifying and manage heat injuries

Heat cramps

A muscle cramp or spasm of the voluntary muscles of the arm, leg, or abdomen caused by depletion in the body of water and salt.

(1) Symptoms
    (a) Painful spasms of skeletal muscles including muscles of the extremities (arms and legs) and abdomen
    (b) Thirst
    (c) Skin may be moist or dry
    (d) Core temperature is normal or minimally elevated

(e) DO NOT ELIMINATE HEAT EXHAUSTION AS A POSSIBILITY. Heat cramps and heat exhaustion may co-exist.

(2) Treatment
- (a) Move casualty to shade
- (b) Loosen clothing
- (c) Gentle stretching of cramped muscles
- (d) Oral hydration with electrolyte solution. If nauseated, IV hydration with 0.9% Normal Saline
- (e) Obtain further medical advice if symptoms continue

Heat exhaustion

A systemic reaction to prolonged heat exposure and is due to sodium depletion and dehydration

(1) Symptoms
- (a) Profuse sweating with pale, moist, and cool skin
- (b) Headache
- (c) Weakness
- (d) Dizziness
- (e) Loss of appetite
- (6) Nausea (with or without vomiting)
- (f) Confusion
- (g) Core temperature may be normal or elevated

(2) Treatment
- (a) Move the casualty to a cool shady area
- (b) Loosen or remove the casualty's clothing and boots
- (c) Oral hydration with electrolyte solution, if tolerated
- (d) IV hydration with 0.9% Normal Saline solution preferred
- (e) Keep casualty supine
- (f) Monitor the casualty and always evacuate - may be heated at BAS and RTD if combat situation dictates

Heatstroke

Caused by failure of the temperature regulating system in the brain. Heatstroke usually involves excessive exposure to strenuous physical activity under hot conditions.

Elderly or chronically ill patients may develop heatstroke without strenuous physical activity.

The hallmark of this condition is altered mental status.

(1) Symptoms
- (a) Sweat may or may not be present
- (b) Skin is red (flushed), hot
- (c) Headache
- (d) Dizziness
- (e) Nausea
- (f) Confusion
- (g) Weakness
- (h) Seizures
- (i) May progress to coma

(j) Respiration and pulse may be rapid and weak
(k) Core temperature is above 104 F
(l) Heatstroke is a medical emergency that will result in death if treatment is delayed

(2) Treatment
(a) Act quickly to prevent further injury
(b) Remove from environment
(c) Active cooling
(i) Remove clothing
(ii) Misting with water and fanning
(iii) Moist wraps
(iv) Immersion in cool water. Do not lower core temperature below 102 degrees. Temperature will continue to drop after removing from water.
(v) Ice packs-groin, axilla
(d) Fluid therapy - IV hydration with 0.9% Normal Saline (if unable to tolerate oral fluids)
(e) Heatstroke is a medical emergency that will result in death if treatment is delayed. Start cooling measures immediately and continue them while waiting for transportation and during evacuation.

Sunburn

(1) Significance
(a) May require hospitalization
(b) Increase risk for further injuries
(c) Impact on readiness
(d) Usually preventable

(2) Prevention
(a) Limit exposure
(b) Cover skin
(c) Use sunscreen
(d) Be aware of potential medication reactions

Salt tablets are not used in the prevention of heat injury. Usually eating field rations or l beral salting of the garrison diet will provide enough salt to replace what is lost through sweating in hot weather.

Watch a heat injury casualty closely for life-threatening conditions, check for other injuries, and seek medical aid.

Heat Illness

The inability to respond (increase in core body temperature) adequately to environmental conditions, inadequate correction of fluid and electrolyte deficiencies, and malfunctions of the system through exogenous and endogenous causes

Heat Stress

A condition that increases the metabolism due to heat which may result in an increase of core temp, perspiration, and cardiac output and result in heat injuries if untreated

General assessment and prevention of heat illness

Heat injury assessment

(1) General assessment findings
- (a) VITAL SIGNS - continually reassess
  - (i) Core body temperature (rectal)
  - (ii) Blood pressure
  - (iii) Pulse
- (b) Nausea, vomiting, diarrhea
- (c) Skin
  - (i) Moist?
  - (ii) Dry?
  - (iii) Cool?
  - (iv) Hot?
- (d) Mental status assessment

(2) Predisposing factors
- (a) Age: pediatric and geriatric-high risk - extremes of age
- (b) General health and medications
  - (i) Cardiac disease
  - (ii) Diabetes
    - * Autonomic neuropathy interferes with vasodilation and perspiration
    - * Autonomic neuropathy may interfere with thermoregulatory input
  - (iii) Obesity
  - (iv) Recent illness
  - (v) Fatigue
- (c) Medications - inh biting sweating
  - (i) Atropine
  - (ii) Antihistamines
  - (iii) Tranquilizers
  - (iv) Cold medications
  - (v) Antidiuretics
- (d) Acclimatization
- (e) Length of exposure
- (f) Intensity of exposure
- (g) Environment
  - (i) Humidity
  - (ii) Wind - wind chill
  - (iii) Ambient air temperature
- (h) Alcohol intake within 24 hours
- (i) Food consumption
- (j) Fever
- (k) Clothing, especially NBC gear
  - (i) The wet bulb globe thermometer (WBGT) index is used to determine the heat condition
  - (ii) Use of MOPP gear increases the WBGT by about 10 degrees

MOPP Gear

In an environment which protective gear or MOPP gear is worn, heat stress is an important factor to consider.

In environments with moderate and relatively comfortable temperatures, MOPP gear can greatly increase temperatures to the most severe and debilitating level of heat stress.

Therefore, it is important that soldiers in MOPP gear maintain adequate water consumptions, are frequently rotated to reduce occurrence of heat injuries, and establish appropriate rest and work periods to ensure adequate manpower is available.

Water consumption - recommendations:

(1) Follow recommendations on heat category chart
(2) "When" is as important as "how much"

Heat injury prevention

(1) Recommendations
  (a) Follow work/rest guidelines on heat category chart
  (b) Restrict or modify strenuous physical activities during high heat stress conditions - if combat situation permits
  (c) Have soldiers take breaks in the shade and drink water
  (d) Hold formations in the shade or off blacktop and concrete surfaces whenever possible
(2) Acclimatization
  (a) Allow two weeks for soldiers to become acclimated to the heat
  (b) Progressively increase the workload during the second week
  (c) During periods of sudden temperature change, treat all soldiers as non-acclimated
(3) Cumulative effect
  (a) Heat effects build up during the day and over several days
  (b) Recovery is slow even after temperatures have decreased
(4) Prevention
  (a) Do heavy work early in the day
  (b) Follow the highest heat category reached for the remainder of the day
  (c) Train the trainer
  (d) Verify heat injury reporting procedures
  (e) Early awareness

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked Combat Medic Vest System (CMVS) or fully stocked M5 Bag, given a casualty with symptoms and findings consistent with cold injury. No other injuries were identified.

Recognize an Environmental Emergency

Environmental Emergency

Medical condition caused or exacerbated by the weather, terrain, atmospheric pressure, or other local factors

(1) Instances of environmental emergencies
(2) Environmental impact on morbidity and mortality
(3) Environmental factors that induce or exacerbate other medical or traumatic conditions

Risk Factors

(1) Age
(2) General health
(3) Fatigue
(4) Predisposing medical conditions
(5) Medications
    (a) Peripheral vasodilator medications
    (b) Diuretics

Environmental Factors

(1) Climate
(2) Season
(3) Weather
(4) Atmospheric (barometric) pressure - the pressure exerted by the weight of the air. An increase in altitude decreases pressure.
(5) Terrain

Types of Environmental Injuries

(1) Heat injury (SEE C191W056, Treat a Casualty with a Heat Injury)
(2) Cold injuries
    (a) Chilblains
    (b) Frostbite
    (c) Immersion foot/trench foot
    (d) Snow Blindness
    (e) Hypothermia (general cooling)
    (f) Dehydration (cold weather)
(3) Localized injuries
    (a) Frostbite
    (b) Radiation burns, e.g., sunburn

Temperature Evaluation

(1) Oral
(2) Axillary
(3) Tympanic
(4) Rectal-only accurate method for determining core body temp
(5) Tactile
    (a) Core temp is higher than preipherial temp (skin)
    (b) When core temp drops to the level of peripherial temp (homeostasis) - this becomes a medical emergency

Mechanisms of heat loss

(1) Physiological
    (a) Conduction - transfer of heat from one substance to another due to difference in temperature
    (b) Convection - transfer of heat through gas or liquid by circulated heat particles
    (c) Evaporation - increase in temperature and a decrease in atmospheric pressure
(2) Environmental
    (a) Weather
    (b) Altitude
    (c) Atmospheric pressure

Predisposing factors

(1) Previous cold injury
(2) Discipline, training, experience
(3) Race/geographic origin
(4) General health and medications
    (a) Hypothyroidism
    (b) Malnutrition, dehydration
    (c) Hypoglycemia
    (d) Medications
(5) Fatigue and exhaustion
(6) Length and intensity of exposure
(7) Climate factors
    (a) Temperature
    (b) Wind
    (c) Precipitation
    (d) Humidity
(8) Activity factors
    (a) Type of combat
    (b) Mobility
    (c) Length of exposure
    (d) Tobacco Usage

Cold Injury preventative measures

(1) Dress
(2) Rest
(3) Food

(4) Limit exposure
(5) Injury control officer/NCO
(6) Plan operations around weather
(7) Provide rewarming tents and hot liquids
(8) Carbon monoxide precautions
(9) Frequent rotations
(10) Use buddy system

Perform specific assessment and management for cold injuries

Chilblains

Cause by repeated prolonged exposure of bare skin at temperature from 60F to 32F, or 20F for acclimated, dry unwashed skin

(1) Signs and symptoms are the following:
  (a) Redness or pallor of affected areas, (fingers, nose, ears)
  (b) Hot, tender, itching skin
  (c) Absence of pain (numb)
  (d) May have ulcerated or bleeding lesions
(2) Emergency care for Chilblains
  (a) Warm the injured body part
    (i) Elevate the affected body part
    (ii) Place the injured body part in contact with a warm object, such as a rescuer's hands or the casualty's body. Instruct the casualty to cross arms and place the hands under armpits.
    (iii) DO NOT RUB TISSUE. Do not apply heat or ice.
  (b) Protect the rewarmed injury from further cold exposure or trauma

Frostbite

An injury of tissue caused from exposure to cold, usually below 32 F depending on the wind-chill factor, duration of exposure, and adequacy of protection. The body parts most easily frostbitten are the cheeks, nose, ears, chin, forehead, wrists, hands, and feet. Signs and symptoms are the following:

NOTE: Signs and symptoms are listed in the order in which they would appear with increased exposure and time.

(1) Superficial
  (a) Loss of sensation or numb feeling in any part of the body
  (b) Sudden whitening of the skin in the affected area followed by momentary tingling feeling
  (c) Redness of skin in light-skinned soldiers, grayish coloring in dark-skinned persons
(2) Deep frostbite is a very serious injury that requires immediate first aid and subsequent medical treatment to avoid or minimize loss of body parts
  (a) Blisters
  (b) Swelling or tender areas

(c) Loss of previous feeling of pain in the affected area
(d) Pale, yellowish, waxy-looking skin
(e) Frozen area feels solid or wooden to the touch

(3) Emergency care for Frostbite

WARNING: **DO NOT** attempt to thaw the casualty's feet or other seriously frozen areas if the casualty will be required to walk or travel to receive further treatment. Thawing in the field increases the possibilities of infection, gangrene, or other injury.

(a) Warm the area at the first sign of frostbite using firm, steady pressure of the hand, underarm, or abdomen (aid giver or buddy's) depending on the area affected.
  (i) Face, ears, nose. Cover the area with the casualty's or a buddy's hands until sensation and color return.
  (ii) Hands. Place the casualty's hands inside his or her clothing against the body and close the clothing. Place the affected hands under the casualty's armpits.
  (iii) Feet Loosen and remove footgear. Place the casualty's bare feet under the clothing and against the body of another soldier.
(b) Loosen or remove tight clothing and watches
(c) Cover the casualty with a blanket or other dry material
(d) Do not cause further injury. Observe the following procedures:
  (i) Do not soak the frostbitten part
  (ii) Do not rub it with snow
  (iii) Do not expose it to any extreme heat source
  (iv) Do not rub or move the part in any way to increase circulation
  (v) Do not allow the casualty to smoke or drink alcohol
  (vi) Do not treat seriously frostbitten parts if the casualty must wa k or travel to receive further treatment
  (vii) Exposing the frozen part to an open fire could cause burns because of the lack of feeling in the area
  (viii) Alcohol and tobacco reduce the body's resistance to cold
  (ix) The casualty should be prepared for pain when thawing occurs
(e) Evacuate patient to appropriate facility

Immersion Syndrome (Immersion foot/Trench foot)

Injuries that result from fairly long exposure of the feet to cool or cold water or mud. Inactive feet in damp or wet socks and boots, or tightly laced boots that impair circulation are even more susceptible to injury.

NOTE: Trench foot occurred frequently during WWI. Soldiers stood in cold, wet, muddy trenches for extended periods of time awaiting the order to move. During Vietnam, soldiers were also faced with the similar environmental conditions as in WWI. Paddy foot was a condition that frequently occurred during this period.

(1) Signs and symptoms of Immersion Syndrome
- (a) Early Stages/First phase
  - (i) Affected area feels cold
  - (ii) Numb and painless
  - (iii) Pulses diminished/absent
- (b) Later Stages/Advanced
  - (i) Limbs feel hot and burning
  - (ii) Shooting pains
  - (iii) Affected area is pale
  - (iv) Blisters, swelling, redness, ulceration
  - (v) Complications-infection, gangrene

(2) Treatment for Immersion Syndrome
- (a) Immediate treatment consists of protecting the extremity from trauma and infection
- (b) Gradually rewarm by exposing to warm air. Do not apply heat, ice, moisten or massage it.
- (c) Dry feet thoroughly and avoid walking
- (d) Elevate the affected part
- (f) Seek medical treatment (Evacuate casualty)

Snow Blindness

A burn to the eye from UV radiation. The damage is to the cornea and similar to a welding flash burn to the eye. It is more likely to occur in hazy, cloudy weather than in sunny weather.

(1) Signs and symptoms of Snow Blindness
- (a) Scratchy feeling in eyes, as if from sand or dirt
- (b) Watery eyes
- (c) Redness to eyes

(2) Emergency treatment for Snow Blindness
- (a) Perform visual acuity
- (b) Cover the eyes with a dark cloth
- (c) Patch both eyes
- (c) Evacuate the casualty for further medical care

Hypothermia

A systemic cold injury. Hypothermia is the decrease of body temperature below 95 degrees and generally occurs from prolonged exposure to temperatures above freezing, especially from immersion in cold water, wet-cold conditions, or from the effect of wind. Physical exhaustion and insufficient food

intake may also increase the risk of hypothermia. Hypothermia is a medical emergency.

(1) Signs and symptoms of Hypothermia
- (a) Mild hypothermia (Core Body temperature 90º-95ºF)
  - (i) Conscious, but usually apathetic or lethargic
  - (ii) Shivering
  - (iii) Pale, cold skin
  - (iv) Slurred speech
  - (v) Poor muscle coordination
  - (vi) Faint pulse
- (b) Severe hypothermia (Core Body temperature 90ºF or lower)
  - (i) Breathing is slow and shallow
  - (ii) Irregular heart action
  - (iii) Pulse weaker or absent
  - (iv) Stupor or unconsciousness
  - (v) Ice cold skin
  - (vi) Rigid muscles
  - (vii) Glassy eyes

(2) Emergency care for Hypothermia
- (a) Mild
  - (i) Rewarm the body evenly. (Must provide heat source, a campfire, or another soldiers body.)
  - (ii) Keep the casualty dry and protected from the elements
  - (iii) Give warm liquids
  - (iv) Evacuate patient to the nearest treatment facility immediately
- (b) Severe
  - (i) Gentle handling of patient

NOTE: A cold heart is more prone to V-Fib. if handled roughly.

  - (ii) Avoid further heat loss
  - (iii) Initiate IV
  - (iv) Place on cardiac monitor, if available
  - (v) Evacuate the casualty to the nearest medical treatment facility as soon as poss ble. Continuous monitoring of vital signs and level of consciousness while in route.

NOTE: Rewarming a severely hypothermic casualty is extremely dangerous in the field due to the great possibility of such complications as rewarming shock and disturbance in the rhythm of the heartbeat.

Dehydration

Occurs when the body loses too much fluid, salt, and minerals. When individuals engage in any strenuous exercises or activities, an excessive amount of fluid and salt is lost through sweat. The danger of dehydration is as

prevalent in cold regions as it is in hot regions. In cold weather, it is extremely difficult to realize that this condition exists.

(1) Signs and symptoms of Dehydration
- (a) Mouth, tongue, and throat are parched and dry
- (b) Swallowing is difficult
- (c) Nausea and dizziness
- (d) Fainting
- (e) Tired and weak
- (f) Muscle cramps especially in the legs
- (g) Focusing eyes may be difficult

(2) Emergency care for Dehydration
- (a) Keep warm
- (b) Loosen clothes to improve circulation
- (c) Give oral and/or IV fluids for fluid and electrolyte replacement
- (d) Rest
- (d) Seek medical assistance

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked M5 Bag or Combat Medic Vest System. You encounter a casualty with suspected eye injury(ies). The casualty has been initially assessed and injury(ies) prioritized.

Assess and provide emergency medical care for an injury to the eye

Assessment of Ocular Trauma

Ocular trauma is classified as penetrating or nonpenetrating.

Trauma can lead to serious damage and loss of vision. Eye injuries are common in spite of protection of eye by the bony orbit.

(1) History/Physical Examination
- (a) Mechanism of injury - blunt trauma vs. penetrating injury? Was there a projectile or missile injury? (glass from a motor vehicle accident) Thermal, chemical or laser burn?
- (b) Does the patient wear glasses?
- (c) History of eye disease
- (d) Visual Acuity-Most important first step in evaluating extent of injury. Screen with any available printed material. If unable to read print, have the patient count your upraised fingers or distinguish between light and dark.

(2) Signs and Symptoms
- (a) Eyelid or corneal foreign bodies-pain, tearing, redness
- (b) Contusions and abrasions - swelling, redness, and impaired or double vision
- (c) Puncture wounds - eye or eyelid perforations; impaled object
- (e) Chemical burns - redness, severe pain, and tearing
- (f) Avulsions - eyelid or eyeball protrudes or is pulled from its socket
- (g) Orbit fractures - Pain, double or decreased vision, swelling, bruising and eyes not moving together if entrapment occurs
- (h) Eyelid lacerations- bruising, unequal eye movements

Emergency Medical Care for Ocular Trauma

(1) Eyelid or corneal foreign bodies (dust or dirt) – Irrigate the eye with copious amounts of water or IV solution. When irrigating the affected eye, turn the patient to the lateral recumbent position, as to not contaminate the unaffected eye. If the foreign body is embedded, cover the eye and evacuate the patient for further medical care.
- (b) Contusions and abrasions - Irrigate the eye, cover both eyes and evacuate
- (c) Puncture wounds - If there is no impaled object, cover the eye with a loose dressing. If impalement is present, stabilize with gauze rolls or folded gauze pads and protect with a cup. Do not remove impaled object and never try to

replace eye in socket or extruded eyeball. Evacuate immediately.

(d) Chemical Burns – Irrigate the eye with copious amounts of water or IV solution for at least 20 minutes while en route to the hospital

(e) Avulsions - Shield and gently cup the eye pulled from its socket with folded moist 4 x 4s. Do not try to force the eye back into its socket. Cover with a loose, moist dressing.

(f) Orbital fractures - Patch the affected eye

(g) With ANY eye injury, cover both eyes, even if only one eye is injured. The eyes use sympathetic movement. When one eye moves, the other eye duplicates the movement.

(h) With both eyes covered, the patient needs assistance for all activities, so you will have to serve as his eyes, keeping him reassured and oriented

Treatment steps for an ocular impalement

(1) Stabilize the object. Place a roll of 3-inch gauze bandage or folded 4 X 4s on either side of the object, along the vertical axis of the head in a manner that will stabilize the object

(2) Fit a disposable paper drinking cup or paper cone over the impaled object (In a field setting it is unl kely that a cup will be readily available. You will have to improvise using the underlying concept of object stabilization) and allow it to come to rest on the dressing roll. Do not allow it to touch the object. This will offer rigid protection and will call attention to the patient's problem. (DO NOT use a Styrofoam cup, which will flake.)

(3) Have another soldier stabilize the dressings and cup while you secure them in place with self-adherent roller bandage or with a wrapping of gauze. Do not secure the bandage on top of the cup.

(4) The uninjured should be dressed and bandaged to reduce sympathetic eye movements

(5) Provide oxygen and care for shock

(6) Continue to reassure the patient and provide emotional support

TERMINAL LEARNING OBJECTIVE

Given a fully stocked M5 Bag or Combat Medic Vest System, IV administration equipment and fluids, oxygen, suction and ventilation equipment (if available), selected medications, immobilization equipment, and documentation forms. You encounter a casualty with a suspected head injury. The casualty's airway has been established and secured. The casualty has been initially assessed and injury(ies) prioritized.

Assess and identify the severity of the head injury

NOTE: Airway, breathing, and circulation assessment and management must take a priority.

Primary assessment

(1) General assessment
(2) Assess airway
(3) Assess breathing
(3) Assess circulation

Secondary assessment - alteration of consciousness is the hallmark of brain injury

(1) Look for obvious injuries
  (a) Depressed or open skull fractures
  (b) Lacerations
  (c) All head injuries must be suspected of having cervical spine involvement and be managed accordingly
(2) Bleeding from ear or nose
  (a) Clear fluid from ear or nose
  (b) Swelling and/or discoloration behind the ear (Battle's sign)
  (c) Swelling and/or discoloration around both eyes (raccoon eyes): may indicate basil skull fracture
(3) Pupils
  (a) Brainstem injury is probable if both pupils are dilated and do not react to light: If pupils are dilated but react to light injury is often reversible
  (b) Other causes of dilated pupils that may or may not react to light:
    (i) Hypothermia
    (ii) Anoxia
    (iii) Lightning strike
    (iv) Optic nerve injury
    (v) Direct trauma to the eye
    (vi) Drug effect
  (c) Fixed/dilated pupils signify injury only in patients with decreased level of consciousness
(4) Extremities - Casualty has intact sensation/motor function if withdrawal or localized pain to pinching of fingers and toes occurs: Usually indicates there is or minimally impaired or normal brain function.
(5) Vital signs

(a) Can indicate changes in intracranial pressure
(b) Observe/record vital signs during secondary survey and each time you perform a reassessment
(c) Increasing intracranial pressure causes increased blood pressure, the reasons for this are:
  (i) In closed head injury Intracranial pressure increases as a result of swelling of the brain due to trauma.
  (ii) As the pressure increases on the brain cerebrovascular perfusion may be compromised.
  (iii) The result of this is an autonomic response by the brain to increase perfusion and this results in an increased blood pressure
(d) Low blood pressure caused by a head-injury is usually a terminal event
(e) Pulse: a decrease in pulse rate is caused by an increase in intracranial pressure
(f) Respirations
  (i) Increasing intracranial pressure causes respiratory rate to increase, decrease, and/or become irregular
  (ii) Unusual respiratory patterns may reflect level of brain/brainstem injury
  (iii) Prior to death, the casualty may develop a rapid, noisy respiratory pattern called central neurogenic hyperventilation
  (iv) Not as useful an indicator as other vital signs in monitoring the course of head injury. Could also be affected by:
    * Fear
    * Hysteria
    * Chronic illnesses
    * Chest injuries
    * Spinal cord injuries
(g) Assess neurologic status (See Glascow Coma Scale Handout)
  (i) Utilize the Glascow Coma Scale (GCS)
  (ii) Severe head injury: GCS is < 9
  (iii) Moderate head injury: GCS is 9 to 12
  (iv) Minor head injury: GCS is 13 to 15

(6) Reassess
(a) Record level of consciousness
(b) Record pupil size and reaction to light
(c) Record vital signs
(d) Decisions on casualty management are made based on changes in all parameters of the physical and neurological examination

(d) Baseline neurological status must be established. Future decisions on treatment depend on baseline evaluations.

Assess and provide emergency medical care for a traumatic facial injury

Impaled object in the cheek

(1) Signs and symptoms
- (a) Obvious object that has passed through an external cheek
- (b) Bleeding into the mouth and throat
- (c) Blood in the mouth and throat may induce nausea and vomiting

(2) Special considerations
- (a) Ensure an open airway
- (b) Ensure airway is free of obstructions (i.e., broken teeth/dentures or oral cavity bleeding)
- (c) If necessary, examine the external cheek and the inside of the mouth to determine if the object passed through the cheek wall.
- (d) If you see an impaled object in the cheek but cannot see both ends, stabilize the object in place. Do not try to remove it as long as the airway is intact.

(3) Treatment and transport considerations
- (a) Immobilize the head and neck
- (b) If the airway is open, leave the object in place and stabilize it. DO NOT TWIST THE OBJECT.
- (c) Pack the inside of the cheek with rolled gauze, leaving 3 to 4 inches exposed, and dress the external wound
- (d) Suction as needed
- (e) Full spinal immobilization
- (f) Transport in lateral recumbent position with head of spine board elevated to allow for drainage
- (g) Give oxygen via the nasal cannula
- (h) Monitor vital signs and airway every 3-5 minutes for any changes

Nasal injuries

(1) Signs and symptoms
- (a) Abrasions, lacerations, and punctures
- (b) Avulsions
- (c) Difficulty breathing through nares
- (d) Epistaxis

(2) Special considerations
- (a) Other injuries may be present
- (b) Ensure airway is patent. Even though the mouth may be clear, blood and mucus released from nasal injuries can flow into the throat causing an obstruction. Expect vomiting and be prepared to suction.
- (c) Treatment and transport considerations
  - (i) Abrasions, lacerations, and punctures - Control bleeding, apply a sterile dressing, then, bandage in place.

(ii) Avulsion - Return the attached flaps to the normal position. Apply a pressure dressing and bandage. Fully avulsed flaps of skin and avulsed portions of external nose should be kept cool and transported with the patient.
(iii) Foreign objects - DO NOT pull free or probe. Transport without disturbing the object.
(iv) Fully immobilize the spine if signs of C-Spine or head injury is present.
(v) Monitor vital signs, airway, and LOC every 3-5 minutes. Transport the patient in a sitting position if no signs/symptoms of a head/spinal injury are present.
(vi) Nosebleeds (epistaxis)
* For a patient with no signs or symptoms of skull fracture or spinal injury, place the patient in a slightly forward, seated position to allow for drainage, or lay the patient back with the head slightly elevated, or turn the head to one side.
* For an unconscious patient or if signs and symptoms of spinal injury are present, fully immobilize the patient on a long spine board. Elevate the board 6 inches and turn it to the side to facilitate drainage.
* You or the patient may pinch the nostrils to control bleeding. Apply pressure for at least 5 minutes and do not pack the nostrils.

CAUTION: If there is clear fluid or a mix of blood and clear fluid draining from the nose or the ears, the patient may have a skull fracture. Do not pinch the nostrils or attempt to stop the drainage flow.

Oral cavity injuries
(1) Signs and symptoms
(a) Lacerated lip or gum
(b) Lacerated or avulsed tongue
(c) Dislodged teeth
(2) Special considerations
(a) Airway obstruction - look for foreign objects i.e. blood, teeth, vomit, mucus, etc.
(b) Remove any dislodged teeth and dental appliances
(i) With a gloved hand, remove loose dentures and any parts of broken dentures
(ii) Transport any dental appliance and broken teeth with the patient. Place the tooth in a container of normal saline or mi k. Do not rub the tooth.

(c) Ensure an open airway
(d) Lacerated lip or gum - Control bleeding by placing a rolled or folded dressing between the lip and the gum leaving a dressing “tail" exposed. For profuse bleeding, position the patient to allow for drainage. Monitor the patient and dressing closely. ONLY IF THE PATIENT IS FULLY ALERT.
(e) Lacerated or avulsed tongue - DO NOT pack the mouth with dressings. Position the patient for drainage. For a fully avulsed tongue, save and wrap the part, keep it cool, and transport it with the patient.
(f) Avulsed lip - Control bleeding with a pressure dressing and position for drainage. Do not bandage across the mouth. Save, wrap, label, and transport any fully avulsed tissues keeping the part cool.
(e) Transport the patient in a sitting position unless signs of spinal/head injury are present

Identify specific head injuries

Head injuries
(1) Scalp wounds
(a) Do NOT underestimate blood loss from a scalp wound
(b) Control with direct pressure
(2) Skull injuries
(a) Linear nondisplaced fractures, compound fractures, or depressed fractures
(b) In adults with large contusion or darkened swelling of scalp, suspect underlying skull fracture
(i) Placing direct pressure upon an obvious depresses or compound skull fracture should be AVOIDED
(ii) Leave penetrating object in the skull in place and immediately transport to the MTF
(iii) For a gunshot wound to the head, unless there is a clear entrance and exit wound to the head, assume the bullet may have ricocheted and be lodged in the neck near the spinal cord

Brain injuries
(1) Concussion
(a) Implication that there is no significant injury to the brain
(b) Trauma to the head with a variable period of unconsciousness or confusion and then a return to normal consciousness
(c) Amnesia from the injury may occur
(d) Short-term memory may be affected and there may be:
(i) Dizziness
(ii) Headache
(iii) Ringing in the ears

(iv) Nausea

(2) Cerebral contusion
- (a) Bruised brain tissue
- (b) History of prolonged unconsciousness or serious alteration in state of consciousness
  - (i) Profound confusion
  - (ii) Persistent amnesia
  - (iii) Vomiting
  - (iv) Abnormal behavior
- (c) Brain swelling may be severe and rapid
- (d) Casualty may appear to have suffered a cerebrovascular accident (stroke) or have focal neurological signs
- (e) Casualty may have personality changes dependent on location of cerebral contusion
- (f) Injured casualties with an altered level of consciousness should be hyperventilated and transported rapidly to a trauma center

(3) Intracranial hemorrhage
- (a) Three major types-epidural hematoma, subdural hematoma, and intracranial hematoma
- (b) Signs and symptoms include:
  - (i) Headache
  - (ii) Visual changes
  - (iii) Personality changes
  - (iv) Slurring of speech
  - (v) Confusion
  - (vi) Changes in level of consciousness and coma

(4) Special considerations
- (a) Suspect brain or C-spine injuries for all head, face, and neck wounds
- (b) Check mouth carefully for broken teeth/blood
- (c) Do NOT attempt to clean the surface of a scalp wound. To do so may cause additional bleeding.
- (d) Do NOT remove impaled objects; stabilize in place
- (e) Gently palpate for depressions
- (f) Do NOT apply a pressure dressing

(5) Treatment and transport considerations
- (a) Ensure an open and clear airway
- (b) Protect for possible neck/spinal injuries
  - (i) Do not lift or attempt to wrap the head of a casualty who is lying down if there are signs of a spinal injury
  - (ii) Neck movement worsens the injury of the casualty with a spinal injury
- (c) Control bleeding by gentle pressure
  - (i) If brain tissue is exposed or cranial/facial fracture suspected, do not apply pressure
  - (ii) Use only enough pressure to stop the flow of blood
  - (iii) Underlying fractures may be present

(d) Manage IV fluids, as indicated
  (i) Administer normal saline or .45 % normal saline only overload
  (ii) Restrict to minimal fluid infusion to avoid overload
(e) Assess for shock:
  (i) Administer fluids as needed to support circulation if hypovolemic shock is the cause
(f) Apply a dressing/bandage being careful not to compromise the airway
(g) If brain tissue is exposed, apply a sterile dressing. Local protocol will dictate whether to apply a moist or dry sterile dressing
(h) Administer a high flow of oxygen
(i) Reassess neurologic status and vital signs
(i) Increase in severity of headache
  (ii) Increase pupil size
  (iii) Progressive weakness on one side
(j) Stabilize impaled object
(k) Support with suction of secretions as needed if available
(l) Administer wound care. Evaluate last tetanus immunization for update, if appropriate
(m) Administer pain control as needed
(n) Full spinal immobilization
(o) Transport in head raised position by elevating the top of the litter or spine board 6 inches. If a facial wound is present, tilt the spine board towards the side of the injury to allow for drainage.
(p) Raise head of bed 30 degrees

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked M5 Bag or Combat Medic Vest System, IV administration equipment and fluids, oxygen, suction and ventilation equipment (if available), selected medications, immobilization equipment and splints, and documentation forms.
You suspect a casualty has sustained a neck spine injury. The casualty has been initially assessed and injury(ies) prioritized.

Identify immobilization devices

Manual

(1) Description
- (a) Stabilization of the C-spine by hand
- (b) Applied in conjunction with securing the airway, prior to application of the cervical collar

(2) Indications
- (a) Initially applied on all suspected spinal injury patients and unconscious patients. Provides temporary stabilization until the cervical collar is applied and the head is secured to the long spine board
- (b) AT NO TIME should the head/neck be twisted or excessively moved. This may create a spinal injury.

Cervical collar

(1) Description
- (a) A firm collar to assist in cervical stabilization
- (b) Cervical collars alone do not provide adequate in-line immobilization. Manual stabilization must not be released before the patient is fully secured to a long spine board.
- (c) Cervical collars **DO NOT** immobilize the cervical spine. Cervical collars keep the head in a neutral position.

(2) Indications - same as manual stabilization
- (a) Initially applied on all suspected spinal injury patients and unconscious patients. Provides temporary stabilization until the cervical collar is applied and the head is secured to the long spine board
- (b) AT NO TIME should the head/neck be twisted or excessively moved. This may create a spinal injury.

Too large of a cervical collar will hyperextend the head/neck, and too small of a cervical collar will hyperflex the head/neck and cause further injury.

Kendrick extrication device (KED)

(1) The KED is a common device

(2) Description
- (a) A short spinal stabilization device used to extricate patients from vehicles or confined spaces
- (b) Used to stabilize the head, the neck, and the spine until the patient can be secured to a long spine board

(3) Indications
- (a) Used when the patient is found in a sitting position or in a vehicle
- (b) When a long spine board cannot be inserted into a vehicle or aircraft because of obstructions

Manual head stabilization can be released only after the head is secured to the KED. Ensure that the straps and the cravats do not impede breathing.

Long spine board

(1) Description
- (a) A long board made of wood, metal, or plastic
- (b) The only device which provides complete spinal immobilization when the patient is properly secured

(2) Indications
- (a) When a patient with suspected spinal injuries is found in a lying or standing position
- (b) A patient extracted using a short board is then moved to the long board for complete spinal immobilization

Even with the collar in place, medic one maintains the head and neck in a neutral position until the logrolling maneuver is completed, and the patient's head is secured to the long spine board. The head, neck, and pelvis are kept in-line during the log roll.

Identify and treat injuries to the spine

Initial assessment of a casualty with a spine injury

(1) Ensure open airway
(2) Assess breathing
(3) Assess circulation. Look for major hemorrhage.

Secondary assessment of a casualty with a spine injury

(1) Consider mechanism of injury
- (a) Falls
- (b) Blunt Trauma
- (c) Penetrating trauma to the head, neck, or torso
- (d) Vehicle accidents

(2) Assessment of the responsive casualty

The patient's ability to walk should never be a factor in determining whether a patient needs to be treated for a spine injury. 20 percent of all spine injuries are seen walking around the accident scene.
- (a) Inquire about the mechanism of injury
- (b) Does your neck or back hurt? Where?
- (d) Can you move your hands and feet?
- (e) Can you feel me touching your fingers/toes? Paralysis or loss of sensation of the upper and/or lower extremities - the most reliable signs of a spinal cord injury if the patient is conscious
- (f) Inspect for:

(i) Contusions
(ii) Deformities
(iii) Lacerations
(iv) Punctures
(v) Penetrations
(vi) Swelling

(g) Palpate for areas of tenderness or deformity
(h) Assess the equality of the strength of the extremities.
(i) Handgrip
(ii) Gently push feet against hands
(i) Assess level of consciousness (LOC)

(3) Assessment of the unresponsive casualty
(a) Determine the mechanism of injury from witnesses
(b) Inspect for:
(i) Contusions
(ii) Deformities
(iii) Lacerations
(iv) Punctures
(v) Penetrations
(vi) Swelling
(c) Palpate for areas of tenderness or deformity.
(i) Tenderness with gentle palpation in area of injury
(ii) Deformity - obvious deformities are rare (i.e., "stepoffs")
(d) Check response to painful stimuli by pinching between the thumb and index finger of the patient or pinch the skin on top of each foot.
(e) Impaired breathing - may indicate damaged spinal nerves, which send information to the respiratory center of the brain
(i) Diaphragmatic breathing
(ii) Panting
(f) Life-threatening C-spine injuries occur with spinal column injuries from C-1 to T-8 due to damage to the spinal nerves and/or brain stem, which interrupt nerve transmission to the respiratory center
(g) Priapism - persistent erection of the penis often associated with a spinal cord injury
(h) Incontinence (bowel and/or bladder)
(i) Soft tissue injury with trauma

Provide Emergency Care of a casualty with a spine injury

(1) Establish and maintain manual in-line stabilization of the head and the neck during the initial assessment. Continue to maintain stabilization until the patient is properly secured to a long backboard.
(2) Assess airway, breathing, and circulation during the initial assessment. If necessary, open the airway using the jaw thrust.
(3) Continually assess pulse and motor and sensory functions in all extremities.

(4) Apply the proper size rigid cervical collar.
- (a) Cervical collars are referred to as extrication collars.
- (b) Stiff collars
- (c) Rigid collars
- (d) C-collars

(5) If patient is found in a lying position, immobilize the patient to a long spine board using the log roll method
- (a) One soldier medic must maintain in-line stabilization
- (b) The soldier medic at the head directs the movement of the patient
- (c) One to three other soldier medics control the movement of the rest of the body
- (d) Quickly assess the posterior body if not already done in the initial assessment
- (e) Position the long spine board under the patient
- (f) Roll the patient onto the board at the command of the soldier medic holding the head
- (g) Pad the voids between the patient and the board
  - (i) Under the head and torso as needed
  - (ii) Pad under the shoulders to the toes on the infant and child to establish a neutral position
- (h) Immobilize the torso to the board by applying straps across the chest and pelvis.
- (i) Immobilize the patient's head to the board
- (j) Fasten the legs proximal to and distal to the knees
- (k) Reassess and record pulse, motor, and sensation

(6) If patient is found in a sitting position, immobilize the patient to a short spine board. See handout for procedures - if available

(7) If patient is found in a standing position, immobilize the patient to a long spine board
- (a) One soldier medic stands behind the patient and maintains in-line stabilization and another soldier medic positions the board behind the patient. A soldier medic stands on each side of the patient and one additional soldier medic at the foot facing the patient.
- (b) The soldier medics on both sides of the patient reach with the hand closest to the patient under the arm to grasp the board and use the hand to secure the head
- (c) Once the position is assured, the medics on the sides place the leg closest to the board behind the board and begin to tip the top backward. The soldier medic at the foot of the board secures the board and the patient to prevent them from sliding, and the board is brought into a level horizontal position.

(8) Assist with ventilation as needed

(9) Care for other injuries

(10) Perform a rapid extraction if indicated

(11) Transport considerations
- (a) Transport immediately
- (b) Monitor for signs/symptoms of neurogenic shock

(c) Continue neurological assessment and monitor vital signs every 3-5 minutes
(d) Initiate two large bore IVs 0.9% Normal Saline

Identify injuries to the neck

Signs and symptoms

(1) Loss of voice or hoarseness
(2) Signs of airway obstruction when the mouth and nose are clear
(3) Contusions on or depressions in the neck
(4) Deformity, swelling, contusions, depressions, and open wounds
(5) Lacerations may produce profuse arterial or venous bleeding.
(6) Subcutaneous emphysema - is the presence of air in soft tissues causing a very characteristic crackling sensation on palpation
(7) Special considerations - With any neck injury, the medic should be concerned with a possible C-spine compromise as well as airway obstruction

Treatment and transport considerations

(1) Ensure a patent airway
(2) Head and neck stabilization
(3) Control bleeding
  (a) Severed neck artery
    (i) Apply direct pressure, or if possible, pinch the artery with the gloved thumb and forefinger/gauze pad until the bleeding stops
    (ii) Administer a high concentration of oxygen
    (iii) Apply an occlusive dressing
  (b) Severed neck vein
    (i) Apply direct pressure
    (ii) Apply an occlusive dressing
    (iii) Administer a high concentration of oxygen
(4) Care for shock and administer a high concentration of oxygen for all neck injury patients
(5) Transport the patient in a lateral recumbent position
(6) Monitor vital signs every 3-5 minutes. Assess for respiratory difficulties.
(7) Any deep, open wound to the neck may have also cut the trachea and may need an occlusive dressing
(8) Initiate two large bore IVs 0.9% Normal Saline

Spinal immobilization using backboards

Using a short backboard

(1) Used for casualties who are in a position that does not allow for use of long backboard.
(2) Priorities of evaluation and management are initiated before application of immobilization devices
(3) The first soldier should immobilize neck in a neutral position at the same time that you begin airway evaluation

(4) When casualty is stable, apply a semirigid extrication collar
(5) Position backboard behind casualty
  (a) The first soldier continues to immobilize neck while backboard is slipped/eased into place
  (b) Support the neck and back if casualty has to be moved forward
(6) Secure casualty to the board: Move strap over a leg, down between both legs, back around the outside of the same leg, across the chest, and attach to the opposite upper straps that were brought across the shoulders
(7) Tighten the straps until the casualty is securely held
(8) Transfer casualty to a long backboard
  (a) Turn casualty so that his back is to the opening through which he is to be removed
  (b) Support the legs so that the upper legs remain at a 90-degree angle to the torso
  (c) Position long backboard under casualty and slide casualty and short backboard up into position on long backboard
  (d) Loosen straps on short board and allow legs to extend out flat
  (e) Retighten the straps
  (f) Secure casualty to long backboard and secure head with padded immobilization device

Using a long backboard

(1) Log-rolling the supine casualty
  (a) Soldier 1 maintains spine immobilization in a neutral position. DO NOT apply traction.
    (i) Apply a semirigid extrication collar
    (ii) Soldier 1 maintains the head and neck in neutral position until log-rolling maneuver is completed
  (b) Casualty is placed with legs extended in normal manner and arms (palms inward) extended by his sides. Casualty will be rolled up on one arm with that arm providing proper spacing and acting as a splint for the body
  (c) Long backboard is positioned next to the body. If one arm is injured, place the backboard on injured side so that the casualty will roll up on the uninjured arm
  (d) Soldier 2 and 3 kneel at casualty's side opposite the board
  (e) Soldier 2 is positioned at the midchest area and soldier 3 by upper legs
  (f) With knees, soldier 2 holds casualty's near arm in place
    (i) Soldier 2 reaches across casualty and grasps the shoulder and hips, holding casualty's far arm in place
    (ii) Usually, it is possible to grasp the casualty's clothing to help with roll
  (g) With one hand, soldier 3 reaches across the casualty and grasps the hip. With the other hand, he holds feet together at lower legs.

(h) Soldier 1 gives order to roll casualty
(i) Soldier 1 carefully keeps head and neck in neutral position during the roll
(j) Soldier 2 and 3 roll victim up on his side toward them
  (i) Casualty's arms are kept locked to his side to maintain a splinting effect
  (ii) Head, shoulders, and pelvis are kept in line during the role
(k) When casualty is upon his or her side, soldier 2 quickly examine back for injuries
(l) Backboard is now positioned next to the casualty
  (i) Soldier 1 gives the order to roll casualty onto the backboard
  (ii) Head, shoulders, and pelvis are kept in line

(2) Log-rolling the prone casualty
(a) Casualty who in not breathing or who is in severe respiratory difficulty must be log-rolled immediately to manage the airway. Unless the backboard is already positioned, you must log-roll the casualty, manage the airway, and then transfer the casualty to the backboard when ready to transport.
(b) Casualty with profuse bleeding of the nose or mouth must not be turned to the supine position
  (i) Profuse upper airway bleeding in a supine casualty is a guarantee of aspiration
  (ii) Casualty will have to be carefully immobilized and transported prone or on his side, allowing gravity to help keep airway clear
(c) Casualty with an adequate airway and respiration should be logrolled directly onto a backboard

TERMINAL LEARNING OBJECTIVE
Given a standard fully stocked M5 Bag or Combat Medic Vest System, immobilization equipment and splints. You encounter a casualty who has suspected musculoskeletal injuries and/or complains of extremity pain. There is no spinal involvement. The casualty has been initially assessed and injury (ies) prioritized.

Assess the musculoskeletal injury

Primary assessment

(1) Assess airway
(2) Assess breathing
(3) Assess circulation - especially pulses distal to site of injury
(4) Assess for signs and symptoms of shock - fracture to larges bones such as the femur and pelvis may cause massive hemorrhage leading the hypovolemic shock.

Secondary assessment

(1) Consider mechanism of injury
  (a) Direct force
  (b) Indirect force
  (c) Twisting force (torsion)
(2) If casualty is conscious, ask:
  (a) Location of injury?
  (b) Pain?
  (c) Tenderness?
  (d) Can he/she move the extremity?
(3) Assess skin
  (a) Color
  (b) Sensation
  (c) Temperature
  (d) Capillary refill
(4) Obtain vital signs
(5) Assess fracture
  (a) Closed fracture
    (i) Bone injury is entirely internal
    (ii) No break in skin
    (iii) Loss of up to a liter of blood can be caused by a closed fractures of one femur - Two fractured femurs can cause hemorrhaging of a life-threatening nature
  (b) Open fracture - open wound of skin
    (i) Occur when sharp end of broken bone pushes out through the skin
    (ii) Made by an object such as a bullet that penetrates from the outside
    (iii) Usually involve extensive damage to tissues and l kely to become infected
    (iv) Look for open wounds and the poss bility of an open fracture
  (c) Fractured bone ends are extremely sharp and pose a serious threat to surrounding tissue

(i) Nerves, arteries, and which frequently are located near the bone or near the skin are often injured
(ii) Neurological injuries may be due to lacerations from bone fragments or from pressure due to hematomas or swelling

(d) Fractures of the clavicle
(i) Injured shoulder is lower than uninjured
(ii) Casualty is usually unable to raise arm above level of the shoulder
(iii) May attempt to support injured shoulder by holding elbow with other hand
(iv) Deformity
(v) Localized pain
(vi) Tenderness

(e) Fractures of the humerus
(i) Pain
(ii) Tenderness
(iii) Swelling
(iv) Wobbly motion at point of fracture
(v) If fracture is near the e bow, arm is likely to be straight with no bend at elbow

(f) Fractures of the radius and/or ulna
(i) When both are broken, the arm usually appears deformed
(ii) When only one bone is broken, the other acts as a splint and the arm retains a more natural appearance
(iii) Pain
(iv) Tenderness
(v) Inability to use forearm
(vi) Unstable fracture segment

(g) Simple rib fractures
(i) Pain localized at site of fracture
(ii) Possible r b deformity
(iii) Coughing or movement is usually painful
(iv) Casualty remains still and often leans toward injured side

(h) Fractures of the pelvis
(i) Can cause extensive bleeding in retroperitoneal space or abdomen
(ii) Usually fractures in several places
(iii) Bone fragments from a fractured pelvis may perforate/lacerate the bladder- an indication may be blood present in the urine
(iv) Bone fragments may lacerate large blood vessels in the pelvis that may cause fatal hemorrhage into the abdomen
(v) Severe pain
(vi) Loss of ability to use lower part of body

(vii) Unable to sit or stand

(i) Fractures of the femur
- (i) Muscle spasm
- (ii) Excruciating pain
- (iii) Unnatural position, external rotation
- (iv) Fractured leg is typically shorter than uninjured because of contraction of thigh muscle
- (v) Swelling at site of fracture
- (vi) Damage to blood vessels and nerves often result

(j) Fractures of the patella
- (i) Pain
- (ii) Deformity of patella

(k) Fractures of the tibia and f bula
- (i) Tenderness
- (ii) Swelling
- (iii) Pain at point of fracture

(6) Assess joints

(a) Injuries to joints and muscles often occur together

(b) Distinguishing between joint or muscle injury and fracture is difficult

(c) Possible joint and muscle injuries:

(i) Dislocations
- * Bone is forcibly displaced from its joint
- * L kely to bruise or tear the muscles, ligaments, blood vessels, tendons, and nerves near a joint
- * Rapid swelling and discoloration
- * Loss of ability to use joint
- * Severe pain
- * Muscle spasms
- * Possible numbness and loss of pulse below the joint
- * Stiff and immobile

(ii) Sprains
- * Injury to ligaments and soft tissues that support a joint
- * Pain or pressure at joint
- * Pain upon movement
- * Swelling and tenderness
- * Possible loss of movement
- * Discoloration

(iii) Strains
- * Forcible overstretching or tearing of a muscle or tendon
- * Pain
- * Lameness or stiffness - sometimes involving knotting of muscles
- * Moderate swelling at place of injury

* Discoloration
* Possible loss of strength in affected area
* Distinct gap felt at site

(iv) Contusions
* Caused by blunt trauma that may damage bones, muscles, tendons, blood vessels, nerves, and other body tissues
* Immediate pain
* Swelling occurs - blood from broken vessels oozes into soft tissues under the skin
* Initial skin reddening due to irritation
* Later, characteristic black and blue marks appear
* Skin eventually turns yellowish or greenish
* Bruised area is usually very tender

(7) Assess Amputations
(a) Potentially life-threatening injuries due to severe tissue damage with subsequent hemorrhage and shock
(b) Massive hemorrhage can occur but most often the bleeding will control itself with a spontaneous retraction of major vessels and ordinary pressure applied to the stump
(c) If possible, locate the amputated part and transport with the patient

Provide emergency care for extremity injuries

Expose the area

Control bleeding

(1) Direct pressure
(2) Pressure dressing
(3) Pressure points

NOTE: Splinting i.e. immobilization is the most effective method to control bleeding of fractures. Splint the fracture(s) in the position found. DO NOT attempt to reposition or straighten the injury.

Treat specific fracture

(1) Fractures of the clavicle
(a) If fracture is open, control bleeding - immobilize
(i) Pressure dressing
(ii) Pressure points
(b) Apply sling and swathe if poss ble
(i) Bend casualty's arm on injured side and place forearm across the chest
(ii) Raise hand about 4 inches above the level of the elbow

(iii) Support forearm in position by means of a wide sling. A wide roller bandage may be used to secure the casualty's arm to the chest
(iv) A figure-of-eight bandage may also be used for a fracture clavicle

(c) Assess for signs and symptoms of shock
(d) Evacuate to nearest treatment facility

NOTE: Splint in the position you find it and evaluate circulation.

(2) Fractures of the humerus
(a) If fracture is open, control bleeding
(i) Pressure dressing
(ii) Pressure points
(iii) Immobilize
(b) If fracture is in upper part of arm near shoulder:
(i) Place a pad or folded towel in armpit
(ii) Bandage arm securely to body
(iii) Support forearm in narrow sling
(iv) Splint should extend from shoulder to elbow
(v) Fasten splinted arm firmly to body and support forearm in narrow sling
(c) If fracture is in middle of humerus:
(i) Fasten two wide splints or four narrow splints around the arm
(ii) Support the forearm in a narrow sling
(iii) Be sure sling does not extend too far up the armpit - this may cause compression of blood vessels and nerves
(d) If fracture is at or near elbow
(i) Do not attempt to straighten or move
(ii) Splint arm in position to prevent further nerve and blood vessel damage
(iii) Exception: if no pulse distal to fracture, gentle traction may be applied and arm splinted
(e) In all cases, assess for signs and symptoms of shock
(f) Transport to nearest treatment facility
(3) Fractures of the radius and/or ulna
(a) If fracture is open, control bleeding
(i) Pressure dressing
(ii) Pressure points
(iii) Immobilize
(b) Straighten forearm is possible
(c) Apply two well-padded splint to forearm, one on top and one on bottom
(i) Splints should be long enough to extend from elbow to wrist
(ii) Use bandages to hold splints in place
(iii) Place forearm across the chest

(iv) Support forearm in position by means of wide sling and cravat bandage
(v) Raise hand about 4 inches above level of e bow
(i) Assess for signs and symptoms of shock
(j) Transport to nearest treatment facility

(4) Simple rib fractures
(a) Ordinarily, rib fractures are not bound, strapped, or taped if the casualty is reasonably comfortable
(b) Provide analgesia available in combat vest
(c) Place casualty in position of comfort
(d) Transport to nearest treatment facility

(5) Fractures of the pelvis
(a) Initiate large bore IV 0.9% Normal Saline
(b) Provide analgesia available in combat vest
(c) Minimize movement - only move unless necessary
(d) Assess for signs and symptoms of shock
(e) Keep casualty supine. Legs may be straight or bend, depending on comfort
(f) Immobilize
(i) Fractures of the hip are best treated with traction splints
(ii) Adequate immobilization can also be obtained by placing folded poncho's, poncho liners or blankets between legs
(iii) Use cravats, roller bandages, or straps to hold the legs together
(iv) Fasten casualty securely to stretcher or improvised support
(g) Transport to nearest treatment facility

(6) Fractures of the femur
(a) If fracture is open, control bleeding - immobilize
(i) Pressure dressing
(ii) Pressure points
(b) Carefully straighten the leg. Apply two splints:
(i) One on the outside of the injured leg - should reach from armpit to foot
(ii) One inside - from groin to foot
(c) Fasten splints
(i) Around ankle
(ii) Over knee
(iii) Just below hip
(iv) Around pelvis
(v) Just below armpit
(d) The legs can be tied together to support injured leg
(e) Assess for signs and symptoms of shock
(f) Transport to nearest treatment facility

(7) Fractures of the patella
(a) Straighten the injured limb

(b) Immobilize fracture by placing padded board under injured limb. The board should be at least 4 inches wide and reach from buttock to heel
(c) Place extra padding under knee and just above heel
(d) Use strips of bandage to fasten the leg to the board
(i) Just below the knee
(ii) Just above the knee
(iii) At the ankle
(iv) At the thigh
(e) Be sure not to cover the knee. Any bandage of tie fastened over the knee could created a problem should swelling occur.
(f) Transport to the nearest treatment facility

(8) Fractures of the tibia and f bula
(a) If fracture is open, control bleeding
(i) Pressure dressing
(ii) Pressure points
(b) Carefully straighten the leg
(c) Consider PASG or apply three splints
(i) Pad each splint well, particularly under the knee and at the bones on each side of the ankle.
(ii) Place splints on both sides and leg and one underneath
(iii) A folded poncho liner and two side splints may be used
(d) When available, use traction splints
(e) Assess for signs and symptoms of shock
(f) Transport to nearest treatment facility

Treat specific joint injury

(1) Dislocations
(a) Loosen clothing around injured part
(b) Place casualty in position of comfort
(c) Support injured part by means of a sling, pillows, bandages, splints
(d) Treat all dislocations as fractures
(e) Evacuate to the nearest treatment facility

(2) Sprains
(a) Treat all sprains as fractures in the field
(b) Apply cold packs for the first 24 to 48 hours to reduce swelling and to control internal hemorrhage
(c) Elevation and rest of affected area
(d) Apply snug, smooth, figure-of-eight bandage to control swelling
(e) Provide immobilization
(f) Transport to nearest treatment facility

(3) Strains
(a) Keep affected area elevated and at rest
(b) Apply cold packs for the first 24 to 48 hours to control hemorrhage and swelling

(c) Apply mild heat to increase circulation and aid healing 24 hours after the last cold pack
(d) Muscle relaxants, adhesive straps, and complete immobilization of the area may be indicated

(4) Contusions
(a) Slight bruises do not require treatment
(b) Apply an elastic bandage to contused area as needed for comfort
(c) Elevate injured part
(d) A sling may be used for a bruised arm or hand. Folded ponchos, poncho liners, clothing, or blankets may be used to elevate a bruised leg
(e) Ice may be applied to contused area for 24 to 48 hours

Assess Amputations

(1) Apply pressure to stump to control bleeding
(2) Cover stump with damp sterile dressing and elastic wrap. Apply tight enough to apply uniform, reasonable pressure across entire stump
(3) If direct pressure does not control bleeding, a tourniquet may be used
(4) Care for the amputated part
(a) Place amputated parts in plastic bag, if available
(b) Place bag in larger bag or container containing ice and water - cooling slows the chemical processes and will increase viability in excess of four hours
(b) Do NOT place amputated part directly on ice

Provide on-going management

(1) Continue to monitor casualty's airway and breathing
(2) Monitor circulation
(a) Reassessing skin for
(i) Color
(ii) Sensation
(iii) Temperature
(iv) Capillary refill
(b) Reassess distal pulses
(3) Monitor vital signs
(4) Continue non-pharmacological and pharmacological interventions
(a) IV fluids
(b) Antibiotics
(c) Analgesics

Principles of splinting

Purposes of Immobilizing Fractures:

(1) To prevent the sharp edges of the bone from moving and cutting tissue, muscle, blood vessels, and nerves
(2) To reduce pain and help prevent or control shock
(3) To prevent bone fragments from converting closed fracture to open fracture
(4) To control bleeding - one of the best ways to control bleeding

Splints are used to immobilize fractures to prevent further damage. In the field, some splints may need to be improvised.

(1) Splints may be improvised from such items as
    (a) Boards
    (b) Poles
    (c) Sticks
    (d) Tree limbs
    (e) Rolled magazines, newspapers, or cardboard
(2) Narrow materials such as wire or cord should not be used to secure a splint in place
(3) If raw materials are not available, anatomical splints may be utilized. For example: the chest wall can be used to immobilize a fractured arm and the uninjured leg can be used to immobilize (to some extent) the fractured leg
(4) Splints should be padded in order to prevent pressure points on bony prominences if standard padding materials are unavailable, padding may be improvised from such items as:
    (a) Clothing
    (b) Blankets
    (c) Ponchos
    (d) Shelter halfs
    (e) Leafy vegetation

Slings, a sling is a bandage (or improvised material such as a piece of cloth, a belt and so forth) suspended from the neck to support an upper extremity

(1) Slings may be improvised by using
    (a) The tail of a coat or shirt
    (b) Pieces torn from such items as clothing and blankets
    (c) The triangular bandage is ideal for this purpose
(2) Remember when applying a sling that the casualty's hand should be higher than his elbow, and the sling should be applied so that the supporting pressure is on the uninjured side

Swathes are bands (pieces of cloth, pistol belts, and so forth) that are used to further immobilize a splinted fracture

(1) Triangular and cravat bandages are often used as or referred to as swathe bandages
(2) The purpose of the swathe is to immobilize, therefore, the swathe bandage is placed above and/or below the fracture - not over it

Prepare the Casualty for Splinting the Suspected Fracture

(1) Reassure the casualty
(2) Loosen any tight or binding clothing
(3) Remove all the jewelry from the casualty distal to the fracture site. If the jewelry is not removed at this time and swelling occurs later, further bodily injury can occur

Procedures for Splinting Suspected Fractures

(1) Gather splints or material for an improvised splint
(2) Ensure that splints are long enough to immobilize the joint above and below the suspected fracture
(3) If possible, use at least four ties (two above and two below the fracture) to secure the splints. The ties should be nonslip knots and should be tied away from the body on the splint.
(4) If splinting material is not available and suspected fracture CANNOT be splinted, then swathes, or a combination of swathes and slings can be used to immobilize an extremity
(5) Pad the splints where they touch any bony prominences. Padding prevents excessive pressure to the area
(6) Check the circulation distal to the injury
    (a) Note any pale, white, or bluish-gray color of the skin which may indicate impaired circulation
    (b) Assess capillary refill
(7) Check the temperature of the injured extremity
    (a) Use your hand to compare the temperature of the injured side with the uninjured side of the body
    (b) The body area below the injury may be cooler to the touch indicating poor circulation
(8) Question the casualty about the presence of numbness, tightness, cold, or tingling sensations
(9) Casualties with fractures to the extremities may show impaired circulation, such as numbness, tingling, cold and/or pale to blue skin distal to injured site. These casualties should be treated and evacuated as soon as possible. Prompt medical treatment may prevent possible loss of the limb

Apply the Splint in Place

(1) Splint the fracture(s) in the position found. DO NOT attempt to reposition or straighten the injury.
(2) If it is an open fracture, stop the bleeding and protect the wound
(3) Cover the wound before applying a splint
(4) If bones are protruding (sticking out), DO NOT attempt to push them back under the skin
(5) Apply padding to protect the area
(6) Place one splint on each side of the arm or leg. Make sure that the splints reach, if poss ble, beyond the joints above and below the fracture.
(7) Tie the splints. Secure each splint in place above and below the fracture site with improvised (or actual) cravats. Improvised cravats, such as strips of cloth, belts, or whatever else you have, may be used

(8) With minimal motion to the injured areas, place and tie the splints with the bandages
(9) Push cravats through and under the natural body curvatures (spaces), and then gently position improvised cravats and tie in place
(10) Use nonslip knots. Tie all knots on the splint away from the casualty. DO NOT tie cravats directly over suspected fracture/dislocation site.
(11) Check the Splint for Tightness
  (a) Check to be sure that bandages are tight enough to securely hold splinting materials in place, but not so tight that circulation is impaired
  (b) Recheck the circulation after application of the splint
    (i) Check the skin color and temperature. This is to ensure that the bandages holding the splint in place have not been tied too tightly.
    (ii) A finger tip check can be made by inserting the tip of the finger between the wrapped tails and the skin
  (c) Make any adjustment without allowing the splint to become ineffective

Apply a Sling if Applicable

(1) An improvised sling may be made from any available nonstretching piece of cloth such as
  (a) A fatigue shirt or trouser
  (b) Poncho or shelter half
  (c) The tail of a coat, belt, or a piece of cloth from a blanket or some clothing
  (d) A pistol belt or trouser belt also may be used for support
  (e) A sling should place the supporting pressure on the casualty's uninjured side
  (f) The supported arm should have the hand positioned slightly higher than the elbow
(2) Insert the splinted arm in the center of the sling
(3) Bring the ends of the sling up and tie them at the side (or hollow) of the neck on the uninjured side
(4) Twist and tuck the corner of the sling at the elbow

Apply a Swathe if Applicable

(1) You may use any large piece of cloth, such as a soldier's belt or pistol belt, to improvise a swathe
(2) The swathe should not be placed directly on top of the injury, but positioned either above and/or below the fracture site
(3) Apply swathes to the injured arm by wrapping the swathe over the injured arm, around the casualty's back and under the arm on the uninjured side. Tie the ends on the uninjured side
(4) A swathe is applied to an injured leg by wrapping the swathe(s) around both legs and securing it on the uninjured side

Evacuate and Provide on-going care and watch closely for development of life-threatening conditions and if necessary, continue to evaluate the casualty

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked M5 Bag or Combat Medic Vest System. You encounter a casualty who has suspected abdomen injury(ies) and/or complains of abdominal pain. There is no spinal involvement. The casualty has been initially assessed and injury(ies) prioritized. Performed appropriate treatment for life threatening abdominal injury(ies). Managed the associated effects of the abdominal injury.

Determine the mechanism of injury

History should be obtained quickly - major cause of mortality or morbidity is delaying in diagnosis.

Index of suspicion

The primary factor in assessing abdominal trauma is NOT the accurate diagnosis of the injury, but rather that an abdominal injury exists. Based on mechanism of injury and visual assessment

(1) Did the casualty fall from a height or hit by a vehicle?
(2) Was there an explosion that hurtles the victim against immobile objects or transmitted blast pressure to organs inside the abdomen?
(3) Ask the victim if a weapon was used:
  (a) Type of weapon i.e. gun, knife, etc.
  (b) Distance from weapon

Blunt mechanisms

(1) Most common type of abdominal injury
(2) High probability of accompanying injuries to other parts of the body
(3) Injury may be from:
  (a) Direct compression of the abdomen
    (i) Solid organs being fractured
    (ii) Blowout of hollow organs
  (b) Deceleration: tearing of organs or their blood vessels
(4) Casualties may have little or no pain with minimal external evidence of injury

Penetrating objects: Energy imparted to the body

(1) Gunshot wounds: Potential injury to abdominal viscera
  (a) Low velocity
    (i) Knife/bayonet
    (ii) Ice pick
  (b) Medium velocity
    (i) Gunshot wounds
    (ii) Shotgun wounds
  (c) High velocity
    (i) High power hunting rifles
    (ii) Military weapons
    (iii) Ballistics
    (iv) Trajectory
    (v) Distance
(2) Stab wound

(a) Casualty may not initially appear to be in shock unless knife penetrates a major vessel or organ
(b) Life-threatening peritonitis can develop within a few hours

(3) The path of the penetrating object may not be apparent from the wound location

The location is also dependent on whether the patient is inhaling or exhaling. This could cause the injury to be an abdominal, lung, or heart injury.

(a) A stab to the chest can penetrate the abdomen
(b) The course of a bullet may pass through numerous structures in various body locations
(c) You must be aware of the possibility of intra-abdominal bleeding with hemorrhagic shock
(d) NEVER REMOVE AN IMPALED OBJECT

Provide emergency care for an abdominal injury

Assessment findings

(1) Perform a primary assessment to ensure airway, breathing, and circulation prior to assessing the abdomen
(2) Secondary survey (specific to abdominal injuries)
  (a) Inspect for:
    (i) Abrasions
    (ii) Contusions
    (iii) External blood loss
    (iv) Wounds
    (v) Impaled objects
    (vi) Evisceration
    (vii) Carefully logroll the casualty to inspect posterior abdomen for exit wounds, bruising
  (b) Palpate for:
    (i) Tenderness
    (ii) Guarding/rigidity
    (iii) Pelvic instability - indicates a pelvic fracture
    (iv) Distention
(3) Severe hemorrhage would be associated with:
  (a) Distension
  (b) Tenderness or tenseness, though tenderness may not be a reliable indicator if causally presents with an altered mental status
(4) The diaphragm is the only muscle sheet separating the chest from the abdomen. Injury is common to both.
(5) Abdominal injuries may present with shoulder pain
(7) Absence of signs and/or symptoms does not rule-out abdominal injuries
(8) Assess for shock (See LP C191W004, Treat for Shock)

Provide emergency medical care for abdominal injury

(1) Ensure open airway

(2) Provide supplemental oxygen
(3) IV access - administer IV antibiotics (Ancef) 1-2 gm
(4) Manage abdominal injuries
  (a) Expose wound
  (b) Control bleeding
  (c) Prevent further contamination
  (d) Apply dry sterile dressing to the wound and bandage securely in place
  (e) Keep casualty calm
  (f) Treat for shock
  (g) Apply oxygen if available
(5) Manage abdominal eviserations
  (a) Do NOT touch or attempt to push abdominal contents protruding from a wound back into the abdomen.
  (b) Cover any organ or viscera protruding from a wound with saline or water moistened gauze: Intestines may become irreversibly damaged if they are allowed to dry
(6) Manage impaled objects
  (a) Do NOT remove a foreign body that is impaled in the abdomen
  (b) Stabilize the object in place
  (c) Expose the wound area
  (d) Control bleeding: bulky dressing may also assist in stabilizing the object (Also see C191W003, Treat for Shock)
  (e) No food or drinks
(5) Transport to a facility with surgical capability

TERMINAL LEARNING OBJECTIVE

Given a Combat Medic Vest System or All-purpose Lightweight Individual Carrying Equipment standard packing list, IV administration equipment and fluids, oxygen, suction and ventilation equipment (if available), selected medications, and documentation forms.

You encounter a casualty who has a suspected chest injury. The casualty has been initially assessed and injury(ies) prioritized.

General Assessment of thoracic trauma

Determine mechanism of injury

(1) A penetrating thoracic wound at the fourth intercostal space (level of the nipples) or lower should be assumed to be an abdominal injury as well as thoracic injury

(2) Thoracic injuries may be result of penetrating objects or blunt trauma
- (a) Penetrating injuries
  - (i) Gunshot or stab wounds
  - (ii) Distr bute forces of injury over a lesser area
  - (iii) Trajectory of a bullet can be unpredictable and all thoracic structures are at risk
- (b) Blunt trauma
  - (a) Force is distributed over a large area
  - (b) Visceral injuries occur from:
    - (i) Deceleration
    - (ii) Compression
    - (iii) Bursting
    - (iv) Sheering forces

Assess the casualty

(1) Identify signs and symptoms
- (a) Major symptoms of chest injury include:
  - (i) Shortness of breath
  - (ii) Respiratory distress
  - (iii) Chest pain
- (b) Signs indicative of chest injury include:
  - (i) Shock
  - (ii) Cyanosis
  - (iii) Hemoptysis
  - (iv) Chest wall contusion
  - (v) Flail chest
  - (vi) Open wounds
  - (vii) Distended neck veins
  - (viii) Tracheal deviation
  - (ix) Subcutaneous emphysema

(2) Assess vital signs
- (a) Pulse

(b) Blood pressure
(i) Hypertension
(ii) Hypotension
(c) Respiratory rate and effort
(i) Tachypnea
(ii) Bradypnea
(iii) Labored
(iv) Retractions
(v) Evidence of respiratory distress

(3) Assess skin
(a) Diaphoresis: secretion of sweat
(b) Pallor: absence of color
(c) Cyanosis
(d) Open wounds
(e) Ecchymosis

(4) Assess the neck
(a) Position of trachea
(b) Subcutaneous emphysema
(c) Jugular venous distension
(d) Penetrating wounds

(5) Assess chest
(a) Contusions
(b) Tenderness
(c) Asymmetry
(d) Open wounds or impaled objects
(e) Crepitation
(f) Paradoxical movement
(g) Lung sounds
(i) Absent or decreased
* Unilateral
* Bilateral
(ii) Location
(iii) Bowel sound in lung area
(h) Lung sounds - percussion
(i) Hyperresonance
(ii) Hyporesonance
(i) Heart sounds
(i) Muffled
(ii) Distant

Identify major, immediate life-threatening thoracic injuries

Pneumothorax
(1) Blunt or penetrating trauma
(2) Fractured ribs may be caused in blunt trauma
(3) Caused by accumulation of air within potential space between visceral and parietal pleura

(4) Diagnosis is based:
- (a) Pleuritic chest pain
- (b) Dyspnea
- (c) Decreased breath sounds on affected side
- (d) Hypertympany to percussion

(5) Management
- (a) Administer oxygen
- (b) Establish two large bore IVs
- (c) Transport to nearest treatment facility
- (d) Chest tube as directed by physician/PA
- (e) Constant Monitoring

Open pneumothorax

(1) Caused by penetrating thoracic injury and may present as a sucking chest wound. Air does not enter the lung, oxygenation of the blood is reduced, ventilation is impaired and hypoxia results

(2) Management
- (a) Ensure an airway
- (b) Quickly close chest wall defect by any available means
  - (i) Occlusive dressing may cause casualty to develop a tension pneumothorax
  - (ii) To avoid, tape occlusive dressing on three sides to produce a flutter valve: air escapes but will not enter the chest
- (c) Administer oxygen
- (d) Insert two large-bore IVs 0.9% Normal Saline to keep vein open (TKO)
- (e) Transport to nearest treatment facility

Tension pneumothorax -closed

(1) Occur when a one-way valve is created from either penetrating or blunt trauma (not open to the outside i.e. penetrating rib etc.)
- (a) Air can leave pleural space
- (b) Causes collapse of affected lung, pushes mediastinum in opposite direction

(2) Clinical signs include:
- (a) Dyspnea
- (b) Anxiety
- (c) Tachypnea
- (d) Diminished breath sounds
- (e) Hyperresonance to percussion on affected side
- (f) Distended neck vein
- (g) Hypotension
- (h) The development of decreased lung compliance in intubated casualty should alert you to the possibility to tension pneumothorax

(i) Late finding is tracheal deviation and its absence does not rule out the presence of a tension pneumothorax

(3) Management
- (a) Establish an open airway
- (b) Administer high-concentration oxygen
- (c) Decompress the affected side of the chest needle decompression. Indication to perform emergency decompression includes:
  - (i) Loss of radial pulse
  - (ii) Loss of consciousness
  - (iii) Respiratory distress
  - (iv) Cyanosis
- (d) Insert two large bore IVs 0.9% Normal Salin TKO
- (e) Transport to nearest treatment facility

Massive hemothorax

(1) At least 1500 cc blood loss into thoracic cavity or 200 ml/hr from chest tube

(2) Signs and symptoms include:
- (a) Hypotensive, from:
  - (i) Blood loss
  - (ii) Compression of heart or great veins
- (b) Neck veins are usually flat secondary to profound hypovolemia, but could be distended due to mediastinal compression
- (c) Dullness to percussion on the affected side and decreased breath sounds

(3) Management
- (a) Secure an airway
- (b) Apply high-flow oxygen
- (c) Rapid transport to appropriate echelon of care - requires surgical management
- (d) Carefully replace volume after IV insertion
- (e) Maintain BP just high enough to maintain a peripheral pulse
- (f) Closely observe for possible development of a tension pnuemothorax, which would require acute chest decompression

Flail chest

(1) Occurs when three or more adjacent ribs are fractured in at least two places
- (a) Result is a segment of chest wall that is not in continuity with the thorax
- (b) Flail segment moves with paradoxical motion relative to the rest of chest wall

(c) Force necessary to produce this injury also bruises the underlying lung tissue: a pulmonary contusion will also contribute to hypoxia
(d) Casualty is at risk for development of hemothorax or pneumothorax and may be in marked respiratory distress
(e) Chest wall palpation may reveal crepitus in addition to the abnormal respiratory motion

(2) Management
(a) Ensure airway
(b) Administer oxygen
(c) Assist ventilation. Pneumothorax is commonly associated with a flail chest, chest decompression may be needed
(d) Rapid transport to appropriate echelon of care
(e) Establish IV
(f) Initiate manual pressure to stabilize the flail segment
(i) Stabilize casualty on backboard
(ii) Try to maintain manual pressure on flail segment while performing log-rolling(in the opposite direction of site of injury) can be dangerous to maintain a stable spine
(g) Monitor heart - myocardial trauma is frequent

Pulmonary contusion

(1) Common chest injury produced by blunt trauma. This bruising of the lung can produce marked hypoxemia

(2) Management consists of:
(a) Oxygen administration
(b) IV insertion
(c) Transport to nearest treatment facility

Myocardial contusion

(1) Potentially lethal lesion resulting from blunt chest injury
(a) Blunt injury to anterior chest is transmitted via the sternum to the heart
(b) In the field, a casualty with significant chest trauma is assumed to have a myocardial contusion

(2) Cardiac Contusion
(a) Chest pain
(b) Dysrhythmia
(c) Cardiogenic shock (rare)

(3) Management
(a) Administer oxygen
(b) Establish two large bore IVs 0.9% Normal Saline
(c) EKG monitoring
(d) Transport to nearest treatment facility

Cardiac tamponade

(1) Usually from a penetrating injury

(2) Pericardial sac is an inelastic membrane surrounding the heart
- (a) When blood rapidly collects between heart and pericardium form a cardiac injury, the ventricles of the heart compress
- (b) Small amount of pericardial blood can compromise cardiac filling

(3) Diagnosis (common but not always present):
- (a) Hypotension
- (b) Muffles heart sounds
- (c) Distended neck veins

(4) Management
- (a) Ensure airway and administer oxygen
- (b) Initiate two large bore IVs 0.9% Normal Saline - electrolyte solution may increase the filling of the heart and increase cardiac output
- (c) Cardiac tamponade is rapidly fatal and cannot be readily treated in the field by medic but may be treated by physician/PA
- (d) Evacuate to nearest treatment facility immediately

Identify thoracic injuries

Fracture of the scapula - first or second rib requires a large force

(1) Transport to appropriate echelon of care after:
- (a) Airway is open
- (b) IV access initiated
- (c) Oxygen has been started

Simple rib fracture

(1) Pain will proh bit casualty from breathing adequately

(2) On palpation, area of rib fracture may be unstable and will be tender

(3) Management
- (a) Give oxygen
- (b) Monitor of pneumothorax or hemothorax
- (c) Encourage casualty to breathe deeply
- (d) Pain Management

Diaphragmatic tears

(1) Can result from a sever blow to the abdomen
- (a) Sudden increase in intra-abdominal pressure can tear the diaphragm and allow herniation of the abdominal organs into the thoracic cavity

(b) Large radial tears in the diaphragm result from blunt trauma

(2) Marked respiratory distress is caused from herniation of abdominal contents into the thoracic cavity: Diminished breath sounds and infrequently bowel sounds may be heard when chest is auscultated

(3) Abdomen can appear scaphoid if a large quantity of abdominal contents are in the chest

(4) Management
(a) Ensure an airway
(b) Administer oxygen
(c) Insert an IV
(d) Transport to appropriate echelon of care

Traumatic asphyxia

(1) Results from severe compression injury to the chest

(2) Sudden compression of heart and mediastinum transmits to force the capillaries of the neck and head

(3) Casualties appear similar to those of strangulation with cyanosis and swelling of the head and neck

(4) Lips and tongue may be swollen and conjunctival hemorrhage may be evident

(5) Management includes:
(a) Airway maintenance
(b) IV access
(c) Treating other injuries
(d) Transport to appropriate echelon of care

Impalement injuries

(1) Caused by penetrating object

(2) Do NOT remove object

(3) Management
(a) Ensure airway
(b) Stabilize object
(c) Insert IV
(d) Transport to appropriate echelon of care

Traumatic aortic rupture

(1) Most common cause of death in falls from heights

(2) Diagnosis is impossible in the field and may be missed in the MTF. History from the field is critically important since many of these casualties have no obvious signs of chest trauma

(3) Management
- (a) Ensure an airway
- (b) Administer oxygen
- (c) Transport to the appropriate echelon of care
- (d) Establish two 14 gauge IV access
- (e) Administer fluids

Tracheal or bronchial tree injury

(1) Resulting from penetrating or blunt trauma
- (a) Penetrating upper airway injuries frequently have associated major vascular injuries and extensive tissue destruction
- (b) A blunt injury can rupture the trachea or main stem bronchus near the carina

(2) Presenting signs include:
- (a) Subcutaneous emphysema of the chest, neck, or face
- (b) Associated pneumothorax or hemothorax

(3) Management
- (a) Prompt transport to appropriate echelon of care
- (b) Observe for signs of a pneumothorax or hemothorax

Combat Trauma Treatment and Management
(PE for Treat a Casualty with a Spine Injury)
Appendix A
Competency Skill Sheets

KED

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Verbalized BSI precautions.	P / F	P / F	P / F
b.	Directed assistant to maintain manual/neutral in-line head stabilization.	P / F	P / F	P / F
c.	Assessed motor/sensory function and distal circulation in upper and lower extremities.	P / F	P / F	P / F
d.	Applied appropriate sized extrication collar before applying KED.	P / F	P / F	P / F
e.	Moved the patient forward as a unit. Positioned KED behind the patient.	P / F	P / F	P / F
f.	Attached chest straps and adjusted as necessary.	P / F	P / F	P / F
g.	Ensured straps do not interfere with breathing.	P / F	P / F	P / F
h.	Attached pelvic straps and adjusted.	P / F	P / F	P / F
i.	Evaluated the need and padded the patients head and neck as necessary.	P / F	P / F	P / F
j.	Secured the patient's head to the KED with cravats while maintaining a manual in-line position.	P / F	P / F	P / F
k.	Reassessed motor/sensory function and distal circulation prior to extrication from vehicle.	P / F	P / F	P / F
l.	Extricated patient from vehicle onto long board, without compromising spinal integrity.	P / F	P / F	P / F
m.	Reassessed motor/sensory function and distal circulation.	P / F	P / F	P / F

Long Spine Board

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Verbalized BSI precautions.	P / F	P / F	P / F
b.	Directed assistant to maintain manual/neutral in-line head stabilization.	P / F	P / F	P / F
c.	Assessed motor/sensory function and distal circulation in upper and lower extremities.	P / F	P / F	P / F
d.	Applied appropriate sized extrication prior to log-rolling patient.	P / F	P / F	P / F
e.	Positioned long board correctly.	P / F	P / F	P / F
f.	Directed/assisted with log-rolling the patient onto the long board without compromising spinal integrity.	P / F	P / F	P / F
g.	Padded any voids between the patient and the board.	P / F	P / F	P / F
h.	Directed/assisted with immobilization of the patients torso to the board with two straps.	P / F	P / F	P / F
i.	Directed/assisted with immobilization of the patient's head to the board.	P / F	P / F	P / F
j.	Secured patient's legs to the board.	P / F	P / F	P / F
k.	Secured patient sufficiently to prevent excessive movement.	P / F	P / F	P / F
l.	Reassessed motor/sensory function and distal circulation.	P / F	P / F	P / F

Combat Trauma Treatment and Management
Treat a Casualty with a Chest Injury
Appendix B
Competency Skill Sheets

Sucking Chest Wound

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Exposed injury by cutting away clothing.	P / F	P / F	P / F
b.	Hand sealed the wound immediately (with a gloved hand).	P / F	P / F	P / F
c.	Covered the wound with large sterile, non-porous dressing, covering the larger wound first if multiple injuries are identified.	P / F	P / F	P / F
d.	Taped three sides down to provide a flutter-type valve.	P / F	P / F	P / F
e.	Maintained C-spine alignment and log-rolled the patient on injured side. Examined the back for an exit wound.	P / F	P / F	P / F
f.	Covered the exit wound with an occlusive dressing.	P / F	P / F	P / F
g.	Taped four sides of the occlusive dressing down.	P / F	P / F	P / F
h.	Placed patients on INJURED side and transported.	P / F	P / F	P / F

91W10
Advanced Individual Training Course

Clinical Handbook
Supportive Care

Department of the Army
Academy of Health Sciences
Fort Sam Houston, Texas 78234

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Appendix A – Insert and Remove NG Tube Catheter, Competency Skill Sheets
Appendix B - Insert and Remove Foley Catheter, Competency Skill Sheets

TERMINAL LEARNING OBJECTIVE
Given a standard fully stocked M5 Bag or Combat Medic Vest System, IV administration equipment and fluids, oxygen, suction and ventilation equipment (if available) and glucometer. You encounter a casualty who has a metabolic and endocrine systems problem.

Principles of glucose metabolism

All body cells use glucose as an energy source
The brain requires a constant supply of glucose
The blood stream delivers glucose to the cells for use as energy
Insulin must be present for glucose to enter the cells
Glucose and insulin balance are necessary for effective metabolism and use of glucose as an energy source

Without insulin

(1) Glucose cannot enter the cell from the bloodstream
(2) Acids are formed when fat is used for energy needs and can lead to diabetic ketoacidosis

The three Ps of weight loss occur when glucose is not adequately metabolized. Frequently seen in undiagnosed diabetics.

(1) Polyuria – The excess amount of glucose in the blood forces water into the bloodstream. The extra water is secreted as excess urine.
(2) Polydipsia – increased thirst that results in increased water drinking. Secondary to increased volume of urine.
(3) Polyphagia – The cells and tissues cannot utilize the sugar in the blood; therefore, the cells begin to starve. This starvation causes hunger and excessive eating.
(4) Weight loss – The cells cannot use the sugar, so they break down fat and protein for energy causing weight loss

Assess the casualty for hypoglycemia and hyperglycemia

Hypoglycemia is a true medical emergency!

Hypoglycemia

(1) Generally defined as a serum glucose level of less than 50 mg/dl
(2) Signs and symptoms (tachycardia, cool, moist or clammy skin, dizziness, complaints of hunger) are consistent with the diagnosis
(3) Signs and symptoms are resolved following glucose administration.

Causes of hypoglycemia

(1) In an insulin-dependent diabetic is often the result of too much insulin, too little food, or both
(2) A diabetic who has not eaten does not have enough dietary intake of glucose to use for a circulating level of insulin
(3) Excessive exercise or exertion uses up the glucose energy stores
(4) Vomiting or diarrhea depletes the body of fluids, electrolytes, and potential sources of glucose

Signs and symptoms of hypoglycemia

(1) Rapid onset - over a period of minutes
(2) Intense hunger
(3) Cold, pale, moist, or clammy skin
(4) Full, rapid pulse
(5) May appear intoxicated
(6) Dizziness and headache
(7) Copious saliva (drooling)
(8) Normal blood pressure
(9) Altered mental status and seizures are symptoms of severe hypoglycemia (blood glucose < 30 mg/dl)

Treatment and transport considerations for hypoglycemia

(1) Conscious patient
  (a) Perform the initial assessment. Check for a medical alert identification
  (b) Perform a focused history and physical exam and SAMPLE history
  (c) Perform a D (dextrose) stick or Accucheck as per local protocol
  (d) Administer oral glucose IAW local protocol if all three of the following are present:
    (i) The patient has a history of diabetes
    (ii) The patient's mental status is altered
    (iii) The patient is awake enough to swallow
    (iv) Dose - one glucose tube
  (e) Adult - Place glucose on the tongue depressor between the cheek and the gum or self administer it between the cheek and the gum
  (f) If oral glucose is not available, give granular sugar, honey, hard candy, or orange juice
  (g) If a patient becomes unconscious, remove the tongue depressor and assure and open the airway
  (h) Monitor and maintain airway
(2) Unconscious patient and/or inability to swallow

WARNING: DO NOT GIVE UNCONSCIOUS PATIENTS ANYTHING BY MOUTH!

  (a) Initiate and maintain IV of normal saline (promotes excretion of keynote bodies)
  (b) Administer pharmacological interventions
    (i) 50% Dextrose
    (ii) Therapeutic effects: Rapidly restores blood sugar levels to normal in states of hypoglycemia
    (iii) Indications: To treat suspected hypoglycemia or a coma of unknown cause
    (iv) Contraindications: Intracranial hemorrhage, known stroke (CVA)

(v) Side effects: Will cause tissue necrosis if it infiltrates
(vi) How supplied: Prefilled syringes containing 50 cc of 50% dextrose (25 Grams)
(vii) Administration and dosage: Give through patent IV line. If possible obtain serum glucose prior to administration dosage is 50ml of 50% solution

(c) Treat patient like any other with an altered mental status
(d) Continue to monitor and maintain airway
(e) Administer oxygen, if available
(f) Start artificial ventilations if necessary
(g) Transport - Continue ongoing assessment en route.

(3) Position patient - If the patient does not require artificial ventilations, place him in a lateral recumbent position in case s/he vomits

When cause is known, treat as though hypoglycemia; give sugar

(1) A patient in diabetic ketoacidosis will not be harmed by having sugar
(2) A patient in severe hypoglycemia will respond rapidly

CAUTION: When a patient appears intoxicated, treat the patient as a diabetic emergency. Always check for underlying conditions. Never assume the patient is "only drunk."

Hyperglycemia

(1) Generally defined as a random blood glucose > 200 mg/dl or a fasting blood glucose > 140 mg/dl

Causes of hyperglycemia

(1) Undiagnosed/untreated diabetic condition
(2) Insulin not taken
(3) Overeating
(4) Infection that disrupts glucose/insulin balance
(5) Myocardial infarction (heart attack)

Signs and symptoms (Blood glucose 200-400 mg/dl)

(1) Patients are often asymptomatic. Increased blood glucose is found on incidental laboratory examination or a random self glucose test.
(2) Slow onset - occurs over a period of days or weeks
(3) Dry mouth
(4) Intense thirst
(5) Frequent urination
(6) Blurred vision
(7) Frequent infections

Signs and symptoms (Blood glucose > 400 mg/dl)

(1) Usually more dramatic presentation
(2) Intense thirst
(3) Abdominal pain
(4) Vomiting
(5) Progressive restlessness/confusion
(6) Respiration may be very deep and rapid (Kussmaul respirations)

(7) Weak, rapid pulse
(8) Warm, red, dry skin
(9) Sunken eyes
(10) Acetone breath (fruity odor)
(11) May appear intoxicated
(12) Normal to slightly low blood pressure

Treatment and transport considerations

(1) Maintain an open airway
(2) Administer a high concentration of O2, if available
(3) Perform D (dextrose) stick or Accucheck per local protocol
(4) Initiate and maintain an IV of Normal Saline
(5) Transport immediately
(6) Continuously monitor vital signs

WARNING: If untreated, hyperglycemia will eventually lead to diabetic ketoacidosis. The metabolism of substances other than sugar creates high levels of acid in the blood. THIS PROCESS CAN LEAD TO DEATH.

Disorders of the Thyroid Gland

Common acute thyroid disorders include

(1) Hyperthyroidism – presence of excess thyroid hormones in the blood
(2) Thyrotoxicosis – a condition that reflects prolonged exposure of body organs to excess thyroid hormones, with resultant changes in structure and function. Thyrotoxicosis is generally caused by Grave's Disease
(3) Thyrotoxic Crisis – "Thyrotoxic Storm" life threatening emergency characterized by hyperthermia, nervous symptoms, and rapid metabolism
(4) Hyperthyroidism – presence of inadequate thyroid hormones in the blood
(5) Myxedema – condition that reflects long-term inadequate levels of thyroid hormones with resultant change in function and structure
(6) Myxedema Coma – uncommon complication of myxedema that can be fatal if respiratory depression occurs. Usually triggered by acute infection, trauma, cold infection, exposure to CNS depressants such as alcohol and drugs.

Thyrotoxicosis

(1) Less serious than Thyroid Storm
(2) Important causes of palpitations
(3) Commonly caused by undiagnosed or untreated Graves' disease, infectious process or surgery

Thyroid storm (more serious form of Thyrotoxicosis)

(1) Medical emergency
  (a) Elevated temperature (T>38.7^{O} C, but may be as high as 41 ^{O} C)
  (b) CNS dysfunction (anxiety, emotional lability, delirium)
  (c) Cardiovascular dysfunction
  (d) Gastrointestinal dysfunction (nausea, vomiting, hyperdefecation or diarrhea, crampy abdominal pain)
  (e) May mimic or complicate sepsis, sympathomimetic intoxication, or a drug withdrawal

Signs and symptoms

(1) Sinus tachycardia (heart rate > 100 bpm) is almost always present
(2) Heart rate may be fast and irregular
(3) Enlarged thyroid may be palpable
(4) Proptosis and other eye findings indicative of Graves' disease
(5) Brisk reflexes
(6) Anxiety
(7) Tremor
(8) Weakness
(9) Heat intolerance
(10) Weight loss
(11) Hyperdefecation
(12) Sweating
(13) Angina and congestive heart failure (CHF) may be present

Treatment considerations

NOTE: In most cases mild thyrotoxicosis is referred for outpatient evaluation and treatment. If patient is symptomatic but not acutely ill, beta–adrenergic blockade with propranolol (slow 1 mg IV bolus may be administered in accordance with physicians' orders).

(1) Emergency care for Thyroid storm
  (a) Provide supportive care including cooling measures (ice packs, cooling blankets)
  (b) Contact MD/PA immediately for specific guidance
  (c) Initiate and maintain IV access and fluids
  (d) Administer oxygen
(2) Provide on-going management for Thyroid storm
  (a) Monitor patient's response to treatment
  (b) Monitor airway if unconscious
  (c) Place patient in quiet, reassuring environment, if possible
  (d) Maintain IV fluids as directed
  (e) Evacuate for further treatment as required
(3) It is imperative to consider other processes as precipitants of thyroid storm or as a primary cause of symptoms
  (a) Infection
  (b) Surgery
  (c) Trauma
  (d) Emotional stress

Hypothyroidism

Hypothyroidism-

A condition of decreased activity of the thyroid gland

(1) Body's normal rate of functioning slows causing mental and physical sluggishness

(2) Most severe form is called myxedema, which is a medical emergency

Risk factors

(1) Over 50 years old
(2) Female
(3) Obesity
(4) Thyroid surgery
(h) X-ray or radiation treatments to the neck

Signs and symptoms

(1) Physical Examination and X-Ray
  (a) Enlarged thyroid on physical exam
  (b) Delayed reflexes
  (c) Slow heart rate
  (d) Low blood pressure
  (e) Low temperature
  (f) Chest x-ray indicates an enlarged heart
(2) Early symptoms:
  (a) Weakness
  (b) Fatigue
  (c) Cold Intolerance
  (d) Constipation
  (e) Weight gain
  (f) Depression
  (g) Joint or muscle
  (h) Thin, brittle fingernails
  (i) Coarse thick hair
  (j) Pale color
(3) Late symptoms:
  (a) Slow speech
  (b) Dry flaky skin
  (c) Thickening of the skin
  (d) Puffy face, hands and feet
  (e) Decreased taste and smell
  (f) Thinning of eyebrows
  (g) Hoarseness
  (h) Menstrual disorders

Myxedema –

Untreated severe hypothyroidism

(1) Thickness of connective tissue in the skin and other tissues including the heart
(2) Most commonly seen in middle aged or elderly

(3) Myxedema Coma is a medical emergency and is manifested by profound hypothermia, bradycardia, and respiratory depression
(4) Treatment is supportive – maintain and monitor airway
(5) Transport/evacuate to definitive care facility immediately
(6) May be fatal if left untreated

TERMINAL LEARNING OBJECTIVE

Given a CMVS or M5 aid bag standard packing list, IV administration equipment and fluids, oxygen, suction and ventilation equipment (if available), selected medications, documentation forms. You encounter a suspected casualty complaining of neurological symptoms. No other injury (ies) is/are present.

Determine the cause and/or mechanism of injury

Levels of Consciousness –

Abnormal levels of consciousness may be associated with decreased or increased neurological activity, such as stupor, coma, delirium, or violent behavior. There may be partial to complete mental clouding or loss of consciousness.

(1) Frequent causes of altered levels of consciousness are cerebrovascular accident (CVA), drugs, poisons, metabolic illness, fever, head injury, subarachnoid hematoma (SAH), Subdural hematoma (SDH), and epidural hematoma

(2) The two major categories of altered levels of consciousness are stupor and coma
- (a) Stupor ranges from partial to almost complete loss of consciousness
- (b) Coma is complete unconsciousness from which the patient cannot be roused

(3) Emergency Management of Life-Threatening Neurological Problems
- (a) Confirm an unconscious state
  - (i) Attempt to arouse the patient by pinching or shouting to rule out sleep or a simple faint
- (b) Secure the airway
- (c) Give supplemental oxygen, if needed
- (d) Establish adequacy of ventilation
  - (i) If respirations are slow or diminished, begin assisted ventilation
- (e) Establish circulation - Begin CPR, if needed. Obtain vital signs, and treat shock, if present.
- (f) Obtain description of the onset of illness or injury and a history of chronic illnesses e.g. diabetes, hypertension, drug abuse, chronic headaches
- (g) Perform a rapid physical examination, utilizing the Glasgow Coma Scale

(4) The Glasgow Coma Scale
- (a) Widely used method of evaluating the level of consciousness
- (b) Glasgow Coma Scale assigns a numerical score to the patient's responses in three categories
  - (i) Eye opening
  - (ii) Best motor response
  - (iii) Best verbal response
- (c) Repeat assessment frequently to assess for changes
- (d) Assess the patient's score in each category, and total the scores of the tree categories.

(5) Treatment - the immediate objective of emergency treatment and stabilization is to maintain life until a specific diagnosis can be made.
DONT Protocol:
(a) **D**extrose
(b) **O**xygen
(c) **N**arcan
(d) **T**hiamin

Assess a casualty in a field setting using the Glasgow Coma Scale

Seek an appropriate location to conduct the neurological status exam

(1) In a hostile zone
(a) Move the casualty to an area that provides adequate cover and concealment
(b) As with all injuries a primary survey must be conducted focusing on the ABC's and stabilizing life-threatening injuries before any type of assessment is started
(c) Time and Circumstances may not permit a full neurological assessment and in fact may dictate that the soldier medic move on to the next casualty after treating for life threatening injuries
(d) Assess the casualty using the Glasgow Coma Scale

Assess a patient with neurological symptoms in a clinical setting

A clinical environment lends itself to the conduct of a full neurological assessment.

Seek an appropriate setting to conduct the neurological status exam.
(1) Use a well-lit room
(2) Free of distractions
(3) If available, question family and friends

Assess mental status and speech

(1) Determine level of consciousness
(a) Normal
(b) Drowsiness
(c) Stupor
(d) Coma
(2) Observe posture and motor behavior
(a) Gait
(b) Gestures
(c) Mannerisms
(d) Speed of movement - fast, normal, and slow
(e) Over or under active
(f) Purposeful or disorganized
(3) Observe dress, grooming, and personal hygiene
(a) Appropriately dressed for age, social status
(b) Cleanliness
(c) Hair, teeth, and nail care
(4) Observe facial expressions
(a) Appropriate to topics being discussed
(b) Describe
(i) Alert
(ii) Tense

(iii) Worried
(iv) Sad
(v) Happy
(vi) Angry
(vii) Laughing

(5) Observe and record the patient's manner, affect, and relationship to persons and things
(a) Describe (afraid, seeking help, evasive, etc.)
(b) Affect- is the patient's voice, facial expression, and movement appropriate to topic being discussed?

Observe speech and language for
(1) Quantity
(2) Rate
(3) Volume - rapid and loud, mania, soft and low

Observe Mood - as reported by patient
(1) Intensity
(2) Duration
(3) Appropriate to circumstances

Observe thought and perceptions – are the patient's perceptions appropriate to the situation?

Memory and orientation
(1) Orientation
(a) person - does pt know who he/she is
(b) place - location, where he/she lives
(c) time - day of week, date, time of day
(2) Attention- does the patient answer appropriately?
(3) Remote memory - place of birth, where he/she is from
(4) Recent memory - questions related to the presenting problem. (the days weather, appointment time, etc.)

Suicidal and homicidal patients
(1) MUST be evaluated by a Medical Officer (MO)
(2) Most are not mentally ill, but overwhelmed by life stressors

Summary/Assessment of Mental Status
(1) Summary of findings/conclusions
(2) The mental exam is the psychiatric counterpart of the physical exam

General approach to the neurologic exam
(1) Organize exam into 5 basic areas
(a) mental status/speech -as previously discussed
(b) cranial nerves
(c) cerebellar
(d) motor
(e) sensory
(f) reflexes

Techniques of examination

(1) Mental status and speech- as described above
(2) Cranial nerves
  (a) Mnemonics for remembering nerves (1st letter stands for first letter of nerve)
    (i) On Old Olympus Towering Tops, A Finn And German Viewed Some Hops (Tests the olfactory, optic, oculomotor, trochlear, trigeminal, abducens, facial, acoustic, glossopharyngeal, vagus, spinal accessory, & hypoglossal)
  (b) Cranial Nerve I (CN-I): Olfactory
    (i) Sense of smell
    (ii) Test by holding familiar items under the patient's nose with their eyes closed. Clamp each nostril testing each one separately.
  (c) Cranial nerve II (CN-II): Optic
    (i) Vision sense
    (ii) Tests visual acuity, visual fields, peripheral vision, and fundoscopic exam
  (d) Cranial nerves III, IV, & VI: Oculomotor = CN-III, Trochlear = CN-IV, Abducens = CN-VI
    (i) Function
      * CN-III - extraocular muscle movement, pupillary light accommodation and consensual reflexes, and elevation of eyelid
      * CN-IV – extraocular muscle movement
      * CN-VI – extraocular muscle movement
    (ii) Test for extraocular muscle movement by:
      * Holding a small object in front of patient
      * Have patient follow object as it is moved through the 6 cardinal positions of gaze
    (iii) Test for size and shape of pupils and pupillary reaction to light
  (e) Fifth cranial nerve (CN-V): Trigeminal nerve
    (i) Function
      * Motor - temporal, and masseter muscles along with lateral movement of the jaw
      * Sensory - three separate distributions, V-1 = to the forehead, V-2= to the cheeks, V-3 = to the chin
    (ii) Test function
      * Test motor function by having patient clench teeth and move jaw side to

side. Palpate strength of muscle contraction. Feel contraction of temporal muscles.
* Test sharp/dull sensation with a safety pin and light touch to forehead, cheeks, and chin on both sides

(f) 7th cranial nerve (CN-VII): Facial nerve
(i) Function
* Motor - muscle of facial expression
(ii) Test function
* Inspect face for symmetry or abnormal movements
* Have patient raise eyebrows, frown, close eyes tightly (and test strength by trying to open them with your fingers). Show upper and lower teeth, smile and puff out cheeks

(g) 8th cranial nerve (CN-VIII): Vest bulocochlear
(i) Function
* Hearing
(ii) Test hearing
* Snap fingers in front of each ear to assess gross hearing function

(h) 9th & 10th cranial nerves: CN-IX Glossopharyngeal, CN-X Vagus
(i) Function
* CN-IX: sensory - posterior ear drum/canal, pharynx. Motor - pharynx.
* CN-X: sensory - pharynx & larynx. Motor - soft palate, pharynx, and larynx/vocal cords.
(ii) Test for
* Vocal quality
* Observe upward movement of posterior oropharynx and symmetry
* Stimulate gag reflex on each side with cotton swab
* Ability to elevate palate

(i) 11th cranial nerve (CN-XI): Spinal accessory nerve
(i) Function
* Motor - upper portion of sternocleidomastoid and trapezius muscles
(ii) Test for
* Ability to turn head side to side
* Ability to shrug shoulders upwards against resistance

(j) 12th cranial nerve (CN-XII): Hypoglossal nerve
(i) Function

* Motor to tongue

(ii) Test for function

* Symmetry, atrophy, or fasciculations
* Have patient move tongue side to side
* Have patient stick tongue out, should not deviate from midline

(3) Cerebellar

(a) Inspection

(i) Ask pt to wa k across room, down hall, turn and come back

(ii) Observe posture

(iii) Note presence of involuntary movements or swaying

(iv) Special maneuvers

* Heel to toe walking in a straight line
* Walk on toes
* Walk on heels
* Romberg test - have pt stand with heels and feet together, arms at sides and eyes closed. Observe for loss of position sense and tendency to fall.
* Hop in place on each foot. This indicates intact lower extremity motor systems, cerebellar function and position sense.

(4) Motor

(a) Assessment of muscle tone

(i) Passive range of motion (with pt relaxed, perform range of motion to limbs for each joint.)

(b) Testing muscle strength

(i) Test specific motor groups

(ii) Have patient actively resist your attempts to flex or extend across specific joints

(iii) Grade muscle strength on scale of 0-5

* 0 = no muscular contraction noted
* 1 = barely detectable flicker of contraction
* 2 = active movement of body part with gravity
* 3 = active movement against gravity
* 4 = active movement against gravity with some resistance
* 5 = active movement against full resistance & without any evidence of fatigue (normal muscle strength)

(5) Sensory

(a) General principles

(i) Note ability to perceive stimulus

(ii) Compare sensation

(iii) Scatter stimuli to cover most major peripheral nerves
(iv) Vary the placement of your exam
(v) Map areas of altered sensation by proceeding in a stepwise fashion outwards until patient detects change
(b) Pain
(i) Use sharp/dull areas of a safety pin
(ii) Use light pressure
(c) Light touch
(i) Touch skin lightly with wisp of cotton and ask patient to respond
(ii) Compare sides

(6) Reflexes
(a) Graded on a 0-4 scale
(i) Four plus (4+) = very brisk, hyperactive
(ii) Three plus (3+) = brisker than normal
(iii) Two plus (2+) = normal
(iv) One plus (1+) = diminished
(v) Zero (0) = absent, no response

Assessment of Patient with Specific Neurological Symptoms

Dizziness and Vertigo

(1) Dizziness is a perception of self-motion or a distortion of gravitational orientation. Dizziness is not a defined disease, but a sensory syndrome that may be produced by numerous diseases.
(2) Vertigo is an illusionary sensation of motion or having objects move around the patient
(3) Dizziness and vertigo should be distinguished from imbalance and syncope (loss of consciousness)
(4) Symptoms - the patient is usually in an upright position when an acute attack occurs. They may experience:
(a) Motor weakness
(b) Epigastric distress
(c) Perspiration
(d) Restlessness
(d) Nausea and vomiting
(e) Tinnitus (ringing in the ears)
(h) Patients commonly have recurrent episodes
(5) Treatment
(a) Management of the patient depends on the disease causing the dizziness or vertigo. All patients MUST have a full cardiac and neurological examination during initial assessment. Dizziness and vertigo are common symptoms in the elderly with cardiac disease.
(b) Initial stabilization utilizing a Glasgow Coma Scale should be performed if the patient is rapidly deteriorating. Serial neurological examinations should be performed while transporting patient to a MD/PA to assess.

(c) All patients with an acute onset of dizziness or vertigo need to be evaluated by an MD/PA

Headaches –

Headaches are the most common pain complaint in patients. The number of different types of headache, their causes, signs, symptoms and treatments often make headache difficult to diagnose and treat. They may be caused by, tension, tumors, trauma, or any number of other causes. The following are the more common types of headaches:

(1) Tension - These headaches are caused by spasm or contraction of muscles or adjacent structures, or they may be associated with fatigue or emotional stress. The muscles attached to the occiput and temple are the most frequently involved. These muscles will be tender to palpation

(a) Symptoms

(i) Feeling of pressure or a bandl ke constriction around head. Pain is almost always bilateral

(ii) Not associated with vomiting. Nausea may be present

(iii) Patient with a tension headache will have a normal neurological examination

(b) Treatment - general measures consist of:

(i) Analgesics

(ii) Rest

(iii) Relaxation

(iv) Massage, and heat applied to the involved musculature

(v) Oral fluid hydration usually benefits headache patients- particularly in a field environment

(2) Migraine - this type of headache is characterized by a paroxysmal attack often preceded by psychological or visual disturbance that is followed by drowsiness. Migraine headaches are believed to be the result of inflammatory vascular changes.

(a) Symptoms

(i) Specific symptoms vary with the type of migraine

(ii) Before the onset of a migraine headache, some patients experience a prodrome or aura. Visual auras are the most common (flashing lights or diminished vision)

(iii) Pain is usually unilateral- sometimes severe

(iv) Nausea, vomiting, photophobia (intolerance to light), phonophobia (intolerance to loud noise) may occur

(v) Patients may have an ill appearance

(vi) Other than an ill appearance, the physical examination are normal

(b) Often there is a family history of migraines, and the frequency of attacks may vary from daily to once every few years

(c) Treatment Overview
(i) Treatment of migraine is a three-faceted approach: abortive (at the immediate onset of headache); interval (during the headache) and prophylactic (to prevent future headaches
(ii) Abortive therapy is useful during the aura or at the start of a migraine. Various oral, nasal and subcutaneous medications (i.e. Cafergot, Imitrex) can be used as abortive therapy.
(iii) Interval therapy is directed at treating the migraine headache. Medications include analgesics (Toradol), antiemetics (Phenergan, Compazine) and abortive agents as above
(iv) Prophylactic therapy is aimed at prevention or reduction of the frequency and severity of headaches. Numerous categories of medications are used for this.
(d) Treatment of an Acute Migraine
(i) Place the patient on bed rest in a darkened room, withhold any food or drink and initiate IV hydration. Fluids are helpful in migraine headaches
(ii) Utilize the medications described above for abortive or interval therapy as ordered by a MD/PA
(iii) Serial neurological evaluations should be performed. Reassess the patient after each medication is given
(iv) Evacuate the patient to be evaluated by an MD/PA for assessment and management

Seizures –

A seizure is defined as the behavioral manifestation of abnormal neurologic activity. Seizures are usually accompanied by altered levels of consciousness. Epilepsy is a pattern of two or more recurrent seizures. In 75% of nontraumatic seizures the cause is unknown. There are two types of seizure classifications

(1) The two major classifications are:
(a) Generalized- bilateral foci that begin simultaneously
(b) Partial- single focus in cerebrum
(2) Generalized Seizures
(a) Most commonly encountered and include the petit mal and grand mal types
(b) Typical generalized seizure
(i) Signs and symptoms
* The patient may fall down and cry out, lose bladder and bowel control, and froth at the mouth
* There is convulsive movement of the body, dyspnea, and cyanosis

* Often the patient bites the tongue and, if not completely unconscious, will be confused and disoriented. The seizure usually lasts 2 to 5 minutes.
* A period of deep sleep is common after the seizure, and the patient will complain of muscle soreness and stiffness upon awakening

(ii) Treatment - immediate treatment is aimed at airway, breathing, and circulation (ABC's) while preventing the patient from injuring him or herself. The second goal is identification of the seizure cause
* Do not use rigid restraints (may cause fractures) or insert objects into the patient's mouth during a seizure
* Never leave the patient alone. Protect the patient from further injury until seizure ends
* Loosen the clothing around the neck, and turn the head to the side to prevent aspiration of saliva and mucus
* Administer an anticonvulsant, such as Ativan 1-2 mg, or diazepam (Valium) 5-10 mg IV over 1-2 minutes. Give Valium only in the presence of active seizures. The objective of drug therapy is complete suppression of symptoms
* Refer the patient immediately to an MD/PA for evaluation. Perform serial neurological examinations during transport

Cerebrovascular Accident (Stroke)

(1) Strokes are caused by destruction of brain matter by intracerebral hemorrhage, thrombosis, embolism, or vascular insufficiency

(2) Stroke presentation is varied, depending on the area of brain that is involved. Symptoms include:
(a) Headache
(b) Nausea
(c) Vomiting
(d) Convulsions
(e) Coma
(f) Consciousness may not always be altered
(g) The patient may experience speech disturbances
(h) Confusion
(i) Loss of memory

(j) Reduction of sensation, and paralysis of extremities or of a complete side of the body
(k) The onset may be sudden and violent, with the patient falling into an immediate coma and exhibiting stertorous breathing
(l) Death from a serious stroke may result in a few minutes to a few days

(3) Treatment
(a) ABC's
(b) Administer IV fluids (TKO)
(c) Place the patient on immediate and strict bed rest
(d) Keep head elevated 30 degrees
(e) Evacuate the patient for hospitalization immediately
(f) Cardiac monitoring, if available
(g) Serial neurological examinations during transport

Subarachnoid Hemorrhage (SAH) –

Characterized by sudden bleeding into the subarachnoid space that may be the result of trauma or a ruptured aneurysm

(1) Symptoms - before the aneurysm ruptures
(a) The aneurysm applies pressure to nerves that will manifest as headaches, ocular palsies, diplopia, facial pain, and a diminished visual field
(b) After rupture, severe headache
(c) Nausea
(d) Vomiting
(e) Stiffness of the neck
(f) Positive Kernig's sign
(i) A diagnostic meningeal sign marked by loss of the ability of a supine patient to completely straighten the leg when it is fully flexed at the knee and hip
(ii) Pain in the lower back and resistance to straightening the leg constitutes a positive Kernig’s sign
(g) Bilateral Babinski's reflex is usually present
(i) Dorsiflexion of the big toe with extension and fanning of the other toes elicited by firmly stroking the lateral aspect of the sole of the foot
(h) The consciousness of the patient may or may not be affected, and the blood pressure is often elevated

(2) Treatment
(a) ABC's
(b) Keep the patient at rest
(c) IV hydration (TKO)
(d) Avoid any medications
(e) Evacuate the patient immediately
(f) Cardiac monitoring
(g) Serial neurological examinations during transport

Subdural hematoma-

Caused by the rupture of a cerebral vein. They may be caused by trauma, tumors or a medication side effect (i.e. anticoagulants). There may be a loss of consciousness at the time of the injury followed by an asymptomatic period that may last for several hours to days

(1) Signs and symptoms the patient may have later
  (a) Increased intracranial pressure as described above
  (b) About one half of all persons with subdural hematoma will experience facial muscle weakness
(2) Treatment
  (a) Ensure that the patient has a patent airway
  (b) Oxygen, if available
  (c) Cardiac monitoring, if available
  (d) Serial neurological examinations during transport
  (f) Evacuate the patient immediately

Epidural Hematoma –

Result of blood collecting in the potential space between the skull and the dura mater. Most (80 to 90 percent) result from blunt trauma to the temporal of temporoparietal area with an associated skull fracture and middle meningeal arterial disruption.

(1) The classic history of an epidural hematoma is for the patient to experience immediate loss of consciousness after significant blunt head trauma. The patient then awakens and has a lucent period prior to again falling unconscious as the hematoma expands.
(2) This "classic" syndrome occurs in only about 20 percent of cases. The majority of patients either never looses consciousness or never regains consciousness after the injury.
(3) Signs and Symptoms
  (a) Increase intracranial pressure as previously described
  (b) Neurological status/mental status may change rapidly due to the high pressure arterial bleeding of an epidural hematoma and can lead to herniation. The sequence of bleeding and herniation usually occurs within hours.
(4) Treatment
  (a) Ensure open, patent airway
  (b) Assist with ventilations, as needed
  (c) Administer oxygen, if available
  (d) Cardiac monitoring, if available
  (e) Elevate head of body 30 degrees
  (f) Serial neurological examinations during transport
  (g) Evacuate the patient immediately

Herniated Disk –

In most cases, herniation or rupture of an intervertebral disk is the result of trauma. It may occur with sudden straining of the back in an odd position or while lifting in the trunk flex position. Herniation may occur immediately (acute trauma) or may take years to occur (repetitive trauma). Most herniation occurs in the lumbosacral area but may also occur in the cervical or thoracic regions.

(1) Signs and symptoms

(a) Over 90 percent of all herniated disks occur at the fourth or fifth lumbar interspace
(b) There is pain upon palpation of the affected area
(c) The patient will have a limited range of motion
(d) The posture of the spine will be abnormal due to the loss of curvature of the spine
(e) The patient may exh bit mild weakness of the foot or extensor areas of the great toe
(f) There may be impaired sensations of pain or touch, and coughing or sneezing may cause radiation of the pain to the calf

(2) Treatment
(a) Place the patient on bed rest with a backboard and administer analgesics for pain
(b) Prevent the patient from using any physical effort
(c) Applications of heat to the area of tenderness is beneficial
(d) Definitive treatment of herniated disks will occasionally require surgery. Most herniated discs can be managed medically, with rest and medications.
(e) Evacuate the patient as soon as possible

Refer to further medical care

Treatment for neurological symptoms

May take many forms, which are beyond the scope of the soldier medic

Several emergency medical procedures-,

Soldier medic can perform to minimize and or prevent further injury in trauma cases, and instances where the cause of injury is not obvious

(1) Ensure that the casualty is removed from the source of injury and is stabilized, focusing on the ABC's and that life threatening injuries are treated promptly
(3) Treat an unconscious casualty as having a potential neck or spinal injury. Immobilize and do not move the casualty unless absolutely necessary
(2) If fractures of the spine are suspected in-line stabilization of the spine is maintained and the casualty is immobilized as necessary
(4) If fractures of the skull are suspected that the casualty is placed in a position where the head is elevated at least 30 degrees unless other injuries prohibit that position
(5) Avoid the use of pain medications that are CNS depressants
(6) Evacuate the casualty a timely manner to the next level of care
(7) Provide on going care to maintain the casualty's condition or prevent the condition from getting worse
(8) As the situation permits document as much information as is available to send along with the casualty, so that more definitive medical care can be administered

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked Combat Medic Vest System (CMVS) or fully stocked M5 Bag, IV administration equipment and fluids, oxygen, suction and ventilation equipment (if available), selected medications, and documentation forms. You encounter a casualty complaining of cardio-pulmonary symptoms. No other injury(ies) is/are present. NBC agents have been ruled out

Assess Cardiac Compromise

Primary assessment

(1) Ensure open airway
(2) Assess breathing
(3) Assess circulation
  (a) If pulse is present, continue assessment
  (b) If no pulse, begin CPR

Secondary assessment (specific to cardiopulmonary symptoms)

(1) Recognize signs of cardiac compromise
  (a) Squeezing, dull pressure, chest pain commonly radiating down arms or to the jaw
  (b) Sudden onset of sweating
  (c) Difficulty breathing (dyspnea)
  (d) Anxiety, irritability
  (e) Feeling of impending doom
  (f) Nausea/vomiting
  (g) Unresponsive to stimuli
(2) Assess vital signs
  (a) Respirations
  (b) Pulse
  (c) Blood pressure
  (d) Temperature
  (e) Pulse oximetry
(3) Focused history
  (a) Onset of symptoms
    (i) Sudden
    (ii) Gradual over time
    (iii) Known cause or "trigger"
  (b) Duration of symptoms
    (i) Constant
    (ii) Recurrent
  (c) Pain on inspiration
  (d) Length of time
  (e) Fever
  (f) Smoking history
  (g) Past medical history of associated diseases
(4) Assess location and level of pain
  (a) Use acronym: OPQRST
    (i) Onset
    (ii) Provocation
    (iii) Quality

(iv) Radiation
(v) Severity
(vi) Time
(b) Apply pain scale
(i) 0 = no pain
(ii) 10 = worst pain

Assess specific cardiovascular disease/disorder

(1) Angina pectoris
(a) Sudden chest pain caused by lack of oxygen supply to a portion of heart muscle
(b) Reduced blood flow to heart muscle usually due to coronary artery disease
(c) Concurrent with or following:
(i) Physical activity
(ii) Stress
(iii) Heavy meals
(iv) Exposure to cold
(v) Windy weather
(d) Signs and symptoms
(i) Pain, pressure, tightness, or squeezing feeling in chest area lasting 3-5 minutes
(ii) Radiation of pain to neck, jaw, teeth, shoulder, arms, upper back, or abdomen
(iii) Shortness of breath
(iv) Weakness
(v) Nausea/indigestion
(vi) Sweating

(2) Acute myocardial infarction (AMI)
(a) Death of a portion of the myocardium caused by inadequate blood/oxygen supply through the coronary arteries
(b) Causes include:
(i) Inadequate blood supply through the coronary arteries long enough in duration that myocardium is damaged from oxygen starvation
(ii) Damage of myocardium causes disruption of normal electrical conduction, resulting in irregular and/or ineffective heart activity
(iii) Blood supply may be reduced or stopped by: coronary artery spasm, embolus, arteriosclerosis, and atherosclerosis
(c) Signs and symptoms
(i) Some or all signs and symptoms of angina pectoris
(ii) Pain may be intermittent (come and go)
(iii) Duration of pain may be 30 minutes to several hours
(iv) Pain may occur while at rest
(v) Rest and/or nitroglycerin do not relieve pain

(vi) Signs of shock
(vii) Dyspnea
(viii) Anxiety, irritability, or denial

(3) Congestive Heart Failure (CHF)
(a) Failure of heart to pump blood adequately to maintain tissue perfusion
(b) Causes include:
(i) Diseased heart valves
(ii) Hypertension
(iii) Obstructive pulmonary disease
(iv) Ineffective pumping of left ventricle. Causes blood to back up into pulmonary circulation, resulting in congestion in the lungs. Can progress to pulmonary edema (an accumulation of fluid in lung tissues and alveoli)
(v) Ineffective pumping of the right ventricle. Causes blood to back up into the systemic circulation, causing edema in hands, lower extremities, and sacral area, and distention of jugular veins.
(c) Signs and symptoms
(i) Agitation
(ii) Tachycardia
(iii) Dyspnea with shallow and labored respirations
(iv) Orthopnea - an abnormal condition in which a person must sit or stand to breathe deeply or comfortably
(v) Noisy respirations
(vi) Edema in extremities
(vii) Diaphoresis
(viii) Possible chest pain
(ix) Distended neck veins
(x) Upright posture

Provide Care for Cardiac Compromise

Primary assessment

(1) Assess airway - ensure open airway
(2) Assess breathing - ensure adequate ventilation
(v) Assess circulation

Manage patient with known cardiac history

(1) Place patient in position of comfort and in a quiet environment
(2) Apply oxygen, as indicated
(3) Apply cardiac monitor, if available
(4) Minimize patient exertion
(a) Use appropriate transfer procedures
(b) Do NOT allow patient to wa k to stretcher or down steps
(5) Loosen restrictive clothing
(6) IV access before administering nitroglycerin

(7) Administer NTG as directed by MD/PA (See LP C191W063, Medication administration)
- (a) Reassess patient history
- (b) If nitro is not prescribed to that patient, gain permission from MD/PA or follow local SOP
- (c) Ensure systolic blood pressure is 100 or above
- (d) Administration
  - (i) Dose is one tablet or spray under tongue
  - (ii) Have patient keep mouth closed until dissolved and absorbed
  - (iii) Verify effectiveness - Patient should report burning sensation under tongue

(8) Initiate cardiac monitoring (See LP C191W059, Cardiac monitoring)
- (a) Placement of electrodes (12-lead EKG)
  - (i) Arms - anterior forearm or biceps
  - (ii) Legs - medial aspect of lower leg
  - (iii) Chest position
    - * V1 - fourth intercostal space, right sternal
    - * V2 - fourth intercostal space, left sternal
    - * V3 - midway between V2 and V4
    - * V4 - fifth intercostal space, midclavicular line
    - * V5 - same level as V4, anterior axillary line
    - * V6 - same level as V4 and V5 - midaxillary line
  - (iv) Ensure patient information has been entered
  - (v) Check leads for contact
  - (vi) Record as needed

Use AED, if needed

(1) Reassess patient's unresponsiveness
(2) Begin or continue CPR efforts
(3) Deliver shock
- (a) Turn on power
- (b) Attach device
  - (i) One pad to right of sternum just below the clavicle
  - (ii) Other to left of precordium
- (c) Initiate analysis of rhythm
- (d) Deliver shock in a series of three as indicated by AED
- (e) Check for pulse after three shocks

(4) Reassess vital signs

Perform ongoing management

(1) Monitor vitals signs every 3-5 minutes
(2) Initiate CPR as needed
(3) Prepare to provide artificial respiration as needed
(4) Run EKG as indicated by MD/PA

Assess Respiratory Symptoms

Primary assessment

(1) Assess airway - ensure open airway
(2) Assess breathing - ensure adequate ventilation
(3) Assess circulation
  (a) If pulse is present, continue assessment
  If no pulse, begin CPR

Secondary assessment (specific to pulmonary symptoms)

(1) Assuming ABCs are intact, begin AMPLE history
  (a) Allergies
  (b) Medications
  (c) Past medical history
    (i) Asthma
    (ii) Heart disease
    (iii) Emphysema
    (iv) Smoking history
  (d) Last oral intake
  (e) Events leading to onset, consider asking:
    (i) Onset of symptoms
      * Sudden?
      * Gradual over time?
      * Known cause or "trigger"?
    (ii) Duration of symptoms
      * Constant?
      * Recurrent?
    (iii) Fever? Chills?
    (iv) Chest pain? Shortness of breath? Difficulty breathing?
    (iii) Have you had a cough?
    * Productive or non-productive?
    * Color of sputum?
    (iv) Other symptoms, such as nausea and vomiting?
(2) Assess vital signs
  (a) Respirations
  (b) Pulse
  (c) Blood pressure
  (d) Temperature
  (e) Pulse oximetry
(3) Assess patient complaints
  (a) When did the medical problems start?
  (b) What are the medical problems?
  (c) Duration of symptoms
    (i) Constant
    (ii) Recurrent
(4) Inspect chest
  (a) Use of accessory muscles and sternal or muscle retraction
  (b) Skin color

(c) Flaring of nares
(d) Difficulty breathing or periods of apnea
(e) Splinting the chest
(f) Stridor
(g) Productive cough
(h) Altered mechanical effort
  (i) Limited rise and fall of chest
  (ii) Gasping
  (iii) Pursed lips
  (iv) Chest wall paradoxical motion
(i) Medical - physiological barriers
  (i) Pneumonia
  (ii) Pulmonary edema
  (iii) Chronic Obstructive Pulmonary Disease (COPD)

(5) Palpate the chest
  (a) Tenderness
  (b) Pain
  (c) Crepitus
  (d) Skin temperature
(6) Auscultate the lungs
  (a) Evaluate both inspiration and expiration
  (b) Wheezing
  (c) Rhonchi, rales
  (d) Absence of breath sounds

Provide Care for Respiratory Illness

Assessment findings

(1) Signs of severe respiratory impairment
(2) Rapid, shallow and short breaths
(3) Decrease lung sounds and/or wheezing

Care for respiratory symptoms

(1) Place patient in position of comfort and in a quiet environment
(2) Apply oxygen, as indicated
(3) Minimize patient exertion
  (a) Use appropriate transfer procedures
  (b) Do NOT allow patient to wa k to stretcher or down steps
(4) Loosen restrictive clothing
(5) IV access, if indicated
(6) Cardiac monitoring, if patient has shortness of breath or chest pain

Upper respiratory infection

(1) Contagious viral infections of the upper respiratory tract
(2) Common symptoms include:
  (a) Inflammation of the mucous membranes
    (i) Nasal congestion
    (ii) Runny nose
  (b) Sneezing
  (c) Sore throat
  (d) Coughing

(3) Provide care - supportive measures
- (a) Consider pain relievers
- (b) Drink plenty of fluid
- (c) Rest

Pharyngitis

(1) Most often caused by viral infections. May be cause by bacteria, such as group A streptococcus, which is commonly termed strep throat.

(2) Symptoms include:
- (a) Sore throat
- (b) Difficulty swallowing
- (c) Fever
- (d) Swollen lymph nodes
- (e) Exudate on tonsils
- (f) Beefy red throat

(3) Provide care
- (a) For viral infections, treatment is to relieve symptoms only
  - (i) Consider pain relievers for pain
  - (ii) Consider gargle with warm salt water
- (b) Bacterial pharyngitis is treated with antibiotics

Bronchitis

(1) Acute bronchitis
- (a) Generally follows a viral respiratory infection
- (b) May be caused by any number of respiratory viruses
- (c) Symptoms include:
  - (i) Cough, usually productive
  - (ii) Shortness of breath
  - (iii) Wheezing
  - (iv) Rales, rhonchi
  - (v) Sore throat
- (d) Provide care
  - (i) Consider inhaled bronchiodilators to open constricted air passages
  - (ii) Consider ant biotics only if sputum color changes to yellow, gray, or green
  - (iii) Consider mucolytic agents to moisten secretions
  - (iv) Provide supportive measures
    - * Rest
    - * Increase humidity to soothe air passages
    - * Increase fluid intake
    - * Refer to MD/PA for treatment

Chronic Obstructive Pulmonary Disease (COPD)

(1) The term COPD identifies patients with emphysema and chronic bronchitis. Although emphysema and chronic bronchitis are diagnosed as treated as separate diseases, most patients with COPD have features of both conditions. Chronic bronchitis is characterized by an excess of bronchial secretions. Emphysema

is characterized by a destruction of air spaces with permanent airspace enlargement

(2) Causes include:
- (a) Smoking- the most common
- (b) Pollution
- (ci) Infection
- (d) Allergies

(3) Symptoms include:
- (a) Excessive, chronic cough
- (b) Sputum production
- (c) Chronic, increasing shortness of breath
- (d) Dyspnea on exertion (DOE)
- (e) In early stages of the disease, patient may be asymptomatic

(4) Provide care
- (a) COPD is largely preventable. Stress smoking cessation
- (b) Consider respiratory treatments to facilitate the removal of thick mucous from airways
- (c) Suggest breathing exercises
- (d) Vaccination against influenza and pneumococcal disease
- (e) Refer patient to MD/PA for treatment

Pneumonia

(1) Viral
- (a) Inflammation of lungs caused by a viral infection
- (b) Two most common viral infections that cause pneumonia
  - (i) Respiratory syncytial virus - Pediatrics
  - (ii) Influenza
- (c) Symptoms include:
  - (i) Cough
  - (ii) Headache
  - (iii) Muscle stiffness
  - (iv) Shortness of breath
  - (v) Fever
  - (vi) Sweating
  - (vii) Fatigue
- (d) Provide care - supportive care
  - (i) Humidified air
  - (ii) Increase fluids
  - (iii) Supplemental oxygen may be indicated
  - (iv) Antiviral medications may be considered. Consult MD/PA for treatment

(2) Bacterial
- (a) Inflammation of lungs caused by bacterial infection
- (b) Caused by different organisms and can range in seriousness. Two common types of organisms are:
  - (i) Pneumococcal
  - (ii) Mycoplasma
- (c) Symptoms include:

(i) Rigors
(ii) Bloody sputum
(iii) Fever
(iv) Chest pain

(d) Provide care
(i) Treat with antibiotics as directed by MD/PA
(ii) Provide supportive treatment

(3) Asthma

(a) Chronic inflammatory disorder characterized by increasing responsiveness of the airways to multiple stimuli
(i) Most acute attacks are reversible and improve spontaneously or within minutes to hours with treatment
(ii) The recognition that asthma is a chronic inflammatory disorder of the airways has significant implications for diagnosis, management, and potential prevention

(iii) Asthma is common in adults and more common in children. Death rates from asthma have been increasing since 1990, despite improved therapies

(b) Occur spontaneously or can be triggered by:
(i) Respiratory infections
(ii) Exercise
(iii) Cold air
(iv) Smoke and other pollutants
(v) Stress or anxiety
(vi) Allergies

(c) Symptoms include:
(i) Tightness in chest
(ii) Audible expiratory wheeze
(iii) Tachypnea
(iv) Course breath sounds
(v) Prolonged expiration
(vi) Restlessness/anxiety
(vii) Paroxysmal cough progressing from dry and hacking to productive
(viii) Diaphoresis

(d) Identify key historical points
(i) Pattern of symptoms
* Perennial
* Seasonal
* Perennial and seasonal
* Continual
* Episodic
* Onset
* Duration
* Frequency
(ii) Aggravating factors
(iii) History of disease

* Age of onset and method of diagnosis
* Course of disease
* Present management and medications
* History or oral corticosteroid use
* Intensive care unit admissions
* History of intubation for asthma exacerbation
* Other medical diseases

(iv) Family history

(v) Social history

* Condition of home
* Exposure to allergens
* Smoking
* Identification of participating causes

(vi) Medications used

(e) Identify risk factors

(i) Past history of sudden severe exacerbations

(ii) Prior intubation for asthma

(iii) Prior admissions for asthma to an intensive care unit

(iv) Two or more hospitalizations for asthma in past year

(v) Three or more emergency care visits for asthma in past year

(vi) Use of more than two canisters per month

(vii) Current use of systemic Corticosteroids or recent withdrawal from systemic corticosteroids

(f) Provide care

(i) Inhaled bronchodilators

(ii) Inhaled corticosteroids

(iii) Oral corticosteroids

(iii) Supportive care

* Nebulization with inhaled sympathomimetics
* Monitor pulse oximetry
* Monitor BP and pulse after each nebulization

(iv) Yearly influenza vaccine

(v) Pneumococcal vaccine

(vi) Refer patient to MD/PA for treatment - medical emergency

(g) Status asthmaticus- Severe prolonged asthma refractory to conventional modes of therapy. Management consists of:

(i) Oxygen therapy

(ii) Nebulization with inhaled bronchodilators

(iii) Intravenous corticosteroids

(iv) Intravenous fluids

(v) May progress to require endotracheal intubation and mechanical ventilation

Administer prescribed inhaler

(1) Reassess patient history
(2) If medication is not prescribed to that patient, gain permission from MD/PA or follow local SOP
(3) Administration
  (a) Patient should first inhale deeply
  (b) Have patient place lips around opening of inhaler
  (c) Press inhaler to activate the spray as the patient inhales deeply
  (d) Patient should hold their breath as long as poss ble to ensure medication is absorbed
(4) Verify effectiveness. Repeat second dose as needed and according to SOP or MD/PA

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(4) Verify effectiveness. Repeat second dose as needed and according to SOP or MD/PA

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked M5 Bag or Combat Medic Vest System, IV administration equipment and fluids, oxygen, suction and ventilation equipment (if available), selected medications, and documentation forms, You encounter a casualty complaining of gastrointestinal symptoms. No other injury(ies) are present. Treat gastrointestinal symptoms IAW cited references.

General assessment

Take focused history for gastrointestinal symptoms

(1) OPQRST
  (a) O-Onset
  (b) P-Provoking/palliative factors
  (c) Q-Quality
  (d) R-Region/Radiation
  (e) S-Severity
  (f) T-Time
(2) Allergies
(3) Medications
(4) Past medical history/past surgical history
(5) Previous history of similar events
(6) Nausea/ vomiting
(7) Change in bowel habits/ stool
  (a) Constipation
  (b) Diarrhea
(8) Weight loss/ Appetite changes
(9) Last meal
(10) Chest pain
(11) Urinary symptoms- burning on urination, frequency
(12) Fever, shakes, chills

Abdominal examination

Note: The abdomen is divided into four quadrants by imaginary lines crossing at the umbilicus — the Right Upper Quadrant (RUQ), Left Upper Quadrant (LUQ), Right Lower Quadrant (RLQ), and Left Lower Quadrant (LLQ)

(1) Inspection: check for scars, bruising, rashes, dilated veins, umbilical hernia or abdominal distention (swelling)
(2) Auscultation: listen for bowel sounds. An arterial bruit (a vascular murmur l ke sound) may be heard and is always abnormal. Bowel sounds may be present, hyperactive, or absent. If sounds are not heard in five minutes of continuous auscultation, consider them absent.
(3) Percussion: begin to percuss the liver down from the right upper chest. Liver dullness begins around the 5th or 6th rib extending

down to the costal (rib) margin. Liver length is usually less than 15 cm.

(4) Palpation: palpate superficially (lightly) and deeper in all quadrants with the patients knees bent to relax the abdominal wall muscles. Assess for tenderness in all 4 quadrants. (will add picture for students)
- (a) RUQ: palpate for the liver during inspiration, usually not palpated. If enlarged, you will feel the edge of the liver as it passes beneath the fingers.
- (b) LUQ: palpate for the spleen on inspiration, usually not palpable.
- (c) RLQ and LLQ: palpate for tenderness (pain increased by pressure). Check for involuntary guarding (tightness of the abdomen), and for rebound tenderness by quickly releasing pressure from the abdomen. Check for peritoneal irritation using the heeltap test.

(5) Rectal Exam: with the patient standing while bending at the waist or curled on his/her side and using a glove and lubricant, slowly insert your index finger. Check the prostate anteriorly (in males) and obtain a stool specimen for blood and test using the hemocult test. This may be outside the scope of 91W.

(6) The Routine Abdominal Examination:
- (a) Inspect abdomen
- (b) Auscultate all four quadrants
- (c) Percuss liver size
- (d) Palpate for enlarged liver
- (e) Rectal examination for blood in stool
- (f) ALWAYS include cardiac and respiratory examination when performing an abdominal examination
- (g) ALWAYS consider whether a male or female genital examination by a M.D./P.A. may be required for complete assessment for the patient. All patients with abdominal pain require genital exam.

Assess for abdominal pain

(1) Types of abdominal pain
- (a) Somatic pain – Sharp, localized pain that originates in the peritoneal walls. Often described as a stabbing or burning pain
- (b) Visceral pain – Poorly localized pain that originates in the walls of hollow organs. Often described as a vague, dull or cramping pain
- (c) Referred pain – is pain that is felt at a location removed from the diseased organ that is causing pain

Identify and manage specific gastrointestinal illness

Upper Gastrointestinal (GI) Disease

(1) Gastroenteritis: an acute syndrome characterized by inflammation of the stomach and intestinal tract. Viral or bacterial infections are the most common cause of acute gastroenteritis
- (a) Signs and symptoms
  - (i) Nausea, vomiting and diarrhea-may be mild or severe
  - (ii) Fever- may or may not be present
  - (iii) Abdominal cramping. Normal to increased bowel sounds
  - (iv) Rectal examination may show blood in the stool
  - (v) May become dehydrated if fluid loss is severe
- (b) Treatment:
  - (i) Rest
  - (ii) Correct fluid loss- either orally or with IV hydration
  - (iii) If vomiting is severe, control with an antiemetic, either orally or by intravenous injection at direction of physician. Contraindicated with invasive organisms.
  - (iv) Refer to a MD/PA for further care, especially when fever, severe abdominal pain or rectal blood is present

(2) Upper GI Bleeding
- (a) The vomiting of blood (hematemesis), passage of black tarry stool (melena), or occult chronic bleeding from the GI tract
- (b) Caused by a number of factors such as: cancerous tumors, peptic ulceration, erosive gastritis, and esophageal varices
- (c) Signs and symptoms: the manifestations of GI bleeding depend on the source, rate of bleeding, and underlying or coexistent disease. Patients with chronic blood loss may present with symptoms and signs of anemia (e.g., weakness, easy fatigability, pallor, chest pain, and dizziness) or chronic rectal bleeding.
- (d) Treatment
  - (i) Hematemesis or melena is a medical emergency
  - (ii) Fluid resuscitation and treatment for shock are indicated
  - (iii) Refer to a PA/MD for more definitive care
  - (iv) Evacuate as soon as poss ble

(3) Peptic Ulcer Disease: erosion of the lining of the stomach or duodenum as a result of gastric acid hyperacidity
- (a) Risk factors- stress, diet, alcohol, caffeine, drugs (ASA, NSAIDs), tobacco, H. Pylori infection and heredity
- (b) Signs and symptoms

(i) Epigastric pain 45-60 minutes after a meal
(ii) May be nocturnal — becoming most severe between midnight and 0200 hrs.
(iii) Pain, described as burning, may be relieved by food or antacid intake
(iv) Epigastric tenderness, occult blood on rectal exam if the ulcer is bleeding
(v) UGI or endoscopy confirms the diagnosis

(c) Treatment
(i) Restriction of coffee, tea, cola, alcohol, aspirin, NSAIDs and tobacco
(ii) Antacids: 30 ml P.O. 1 and 3 hours after meals and at bedtime, Cimetidine (Tagamet) 400 mg P.O. BID or 800 mg P.O. at bedtime.
(iii) Refer to MD/PA for full evaluation

(4) Esophageal varices: An esophageal varix is a dialated vein of the esophagus. Primary causes of esophageal varices are alcohol consumption, portal hypertension, and the ingestion of caustic substances.

(a) Signs and symptoms: the physical findings in esophageal varices are:
(i) Hematemesis with bright red blood
(ii) Dysphagia (difficulty swallowing)
(iii) Burning or tearing sensation as the varices continue to bleed, irritating the lining of the esophagus
(iv) May exhibit classic signs of shock, including tachycardia, tachypnea and cool diaphoretic skin

(b) Treatment:
(i) Two large bore IV's
(ii) Treatment for shock and immediate evacuation to a definitive care facility

(5) Esophageal reflux: "Gastroesophageal Reflux Disease" (GERD) is a term applied to the symptoms of tissue damage caused by the reflux of gastric contents (usually acidic) into the esophagus

(a) Signs and symptoms
(i) Heartburn, burping, regurgitation — worse when lying down, frequently severe substernal pain, occurring 30 — 60 minutes after eating
(ii) May manifest as laryngitis, chronic cough due to aspiration of gastric contents
(iii) The physical exam is usually normal
(iv) Cardiac disease MUST be ruled out prior to a diagnosis of reflux esophagitis is given

(b) Treatment:
(i) Weight reduction if obese
(ii) Avoid eating near bedtime
(iii) Antacids after meals and at bedtime
(iv) Avoid tobacco, alcohol and caffeine

(v) Elevation of the head of the bed with 6 inch blocks helps
(vi) Avoid large meals
(vii) Tagament, Zantac, and Prilosec are oral medications to be used to reduce acid reflux

Lower Gastrointestinal (GI) Disease

(1) Constipation: considered if defecation is delayed for days beyond the patients normal, or if the stools are unusually hard, dry, and difficult to move
  (a) Signs and symptoms: difficulty or straining on defecation, occasionally with abdominal cramping. Usually no severe pain, nausea, vomiting or blood in stools. Normal bowel sounds on physical examination. Usually has no bleeding on hemoccult rectal exam.
  (b) Treatment: increase intake of water and fiber (fruits, bulky vegetables, and bran cereals. Daily exercise. Metamucil 2 tsp. in water or juice 2 —3 x qd Milk of Magnesia 2 tsp. at Hs Bisacodyl (Dulcolax) 10 — 15 mg orally or suppository one rectally at hs, Fleets enemas.
(2) Diarrhea: frequent passage of unformed watery bowel movements. May be due to viral, bacterial or parasitic infections
  (a) Four basic mechanisms of diarrhea
    (i) Increased intestinal secretion
    (ii) Decreased intestinal absorption
    (iii) Increased osmotic load
    (iv) Abnormal intestinal motility
  (b) Signs and symptoms
    (i) Frequent, loose or watery stools
    (ii) Change in consistency
    (iii) Bloody (refer to Colitis) or nonbloody
    (iv) Mucus
    (v) Pus
    (vi) Fatty materials, oil, grease (stools will float if high in fat)
    (vii) Character and volume
      * Describe the stools appearance: watery, bloody, or black and tar-like?
      * How long does it last? Number of bowel movements per day?
      * Do you have cramping associated with the bowel movement
  (c) Etiology
    (i) Can be caused by nerves, viral, or bacterial infection
    (ii) Nocturnal diarrhea may suggest organic disease of the bowel
    (iii) Toxic substances
    (iv) May be found in family history of GI disorders

(v) Different food or water as in history of travel
(vi) Poor water or food sanitation or poor hygiene (Food Poisoning)
(vii) Sexual transmission
(viii) May have fever associated with dehydration
(ix) Determine circumstances surrounding the onset
* **Acute diarrhea** - usually caused by infection; chronic may be caused by systemic illness; intermittent by psychological factors: Did it begin rapidly or gradually?; Were you under any stress at the time of onset?; What foods did you eat before it began?; Have you recently changed your diet?; Any travel history? Camping? Deployment?
* **Chronic**: when do you last recall not having the symptom?
* **Intermittent**: How long do intervals between episodes last?; Does diarrhea alternate with constipation?

(d) Treatment
(i) Dictated by cause when known
(ii) Clear liquids for 24 hours, then diet as tolerated
* Replacing lost fluid and electrolytes is the most important therapeutic measure in acute diarrhea
* If patient is significantly dehydrated, start IV fluid
* If patient is not vomiting and mild dehydration: oral rehydration
(iii) Avoidance of agents that worsen diarrhea:
* Caffeine
* Dairy products
* Raw fruits and vegetables
(iv) Kaopectate indicated only if illness and diarrhea continues
(v) May give Lomotil or Imodium if no blood in stool or no fever
(vi) If febrile or blood in stool, refer to MD/PA for antibiotic therapy and lab studies
(vii) Withhold food for 24 hrs — clear liquid diet only, force clear liquids. Kaopectate liquid: 2 tbs. after each loose bowel movement (or 2 tbs.). Refer to MD/PA if not improved.

(3) Lower GI Bleeding
(a) Signs and symptoms: Hematochezia (passage of bright red rectal blood), melena (dark or black tarry stool). 10% of hematochezia is due to an UGI bleed (Fast transit of blood)

(b) Caused by a number of factors: colitis, malignancy, anorectal disease, inflammatory bowel disease, hemorroids
(c) Treatment
(i) Hematochezia and melena are medical emergencies
(ii) Initiate two Large Bore IV's
(iii) Fluid resuscitation and treatment for shock are indicated
(iv) Referral to an MD/PA for definitive management
(v) Evacuate as soon as poss ble

(4) Colitis: the term colitis applies to inflammatory diseases of the colon (e.g. ulcerative, granulomatous, ischemic, radiation, infectious colitis or irritable bowel syndrome)
(a) Signs and symptoms: bloody diarrhea of varied intensity and duration is interspersed with asymptomatic intervals. Usually an attack begins insidiously, with increased urgency to defecate, mild lower abdominal cramps, and blood and mucus in the stools. However, an attack may be acute and fulminant, with sudden violent diarrhea, high fever, signs of peritonitis, and profound toxemia. Some cases develop following a documented infection (e.g., amebiasis, bacillary dysentery).
(b) Treatment: dependent on diagnosis. Initial onset to be considered a medical emergency. Refer to MD/PA for management

(5) Appendicitis: obstruction of the appendix by a fecalith, inflammation, foreign body or tumor
(a) Signs
(i) Classic presentation: Anorexia and pain in the epigastric or periumbilical area of the abdomen that evolves into pain in RLQ over 8 hours, often, signs and symptoms do not follow classic presentation
(ii) Nausea, diarrhea, and vomiting may accompany pain. Occasionally, constipation is present. The pain is moderately severe and after several hours localizes to the RLQ
(iii) Acute abdomen
(iv) Patient often will point precisely to the RLQ area of pain (positive McBurney's sign)
(b) Symptoms
(i) Abdominal tenderness
(ii) Fever may be present
(iii) Decreased bowel sounds if perforated
(iv) Rebound tenderness
(v) Rovsing sign (peritoneal irritation producing right lower quadrant pain with palpation of the left lower quadrant)

(vi) Psoas sign (pain with active flexion against resistance or passive extension of the right hip)
(vii) Obturator sign (pain with passive internal rotation of the flexed right hip)
(viii) Voluntary or involuntary guarding
(ix) Rectal tenderness is common

(c) Treatment: Appendicitis is a surgical emergency. Refer to PA/MD and evacuate immediately

(6) Diverticular Disease: typically presents with left lower quadrant pain and tenderness, similar to the right-sided pain and tenderness of appendicitis

(a) Signs and symptoms:
(i) Abdominal pain, usually in the left lower quadrant
(ii) Nausea and vomiting
(iii) Constipation
(iv) Diarrhea
(v) Left lower quadrant tenderness, guarding, rebound
(vi) Fever
(vii) General peritonitis with tachycardia, high fever, and sepsis if colonic perforation occurs

(b) Treatment
(i) Diverticular disease is primarily a clinical diagnosis
(ii) Outpatient treatment: bowel rest and broad-spectrum oral antibiotic therapy. Patients are instructed to limit activity and maintain a liquid diet for 48 hours. If symptoms improve, low-residue foods are added to the diet.
(iii) If patient demonstrates signs of toxicity: fever, tachycardia, leukocytosis and severe abdominal pain, intravenous antibiotics are administered (authorized by MD/PA)

(7) Bowel Obstruction: complete arrest or serious impairment of the passage of intestinal contents caused by a mechanical blockage. Mechanical obstruction is divided into obstruction of the small bowel, including the duodenum, and the large bowel. Major causes are hernia and adhesions

(a) Signs and symptoms:
(i) Obstruction of the small bowel is based on a triad of symptoms:
* Abdominal cramps are centered around the umbilicus or in the epigastrium; if cramps become severe and steady, consider strangulation (lack of blood flow to the bowel)
* Vomiting starts early with small-bowel and late with large-bowel obstruction

* Constipation occurs with complete obstruction, but diarrhea may be present with partial obstruction

(ii) Obstruction of the large bowel: symptoms usually develop more gradually than with small-bowel obstruction. Increasing constipation leads to obstipation and abdominal distention. If the ileocecal valve is competent, there may be no vomiting; if it allows reflux of colonic contents into the ileum, vomiting may occur (usually several hours after onset of symptoms). Lower abdominal cramps unproductive of feces are present.

(b) Treatment

(i) A nasogastric tube is inserted and placed on suction

(ii) An inlying bladder catheter helps monitor urinary output

(iii) IV hydration

(iv) Complete obstruction is treated surgically after supportive therapy has been initiated

(v) Bowel obstruction should be considered a surgical emergency. Refer patient to an MD/PA and evacuate immediately

(7) Hemorrhoids: a varicose vein in the lower rectum or anus. Caused by straining at stool, constipation, prolonged sitting and a diet poor in fiber.

(a) Signs and symptoms: itching, irritation and bleeding with bowel movements. Obvious external hemorrhoid or internal hemorrhoids found on rectal examination. Mucoid discharge from rectum

(b) Treatment: high roughage/fiber diet. Sitz bath (sitting in warm water reduces pain and swelling). Metamucil 2 tsp. in water or juice 1-3 times daily. Anusol or Anusol HC suppositories for internal hemorrhoids can be given two-three times a day.

(c) Complications: A thrombosed hemorrhoid is caused by the rupture of a vein, forming a clot in the subcutaneous tissue. A tender bluish mass is visualized. Thrombosed hemorrhoids require evaluation by an MD/PA.

Liver, Biliary Tract and Pancreatic Diseases

(1) Hepatitis

(a) Hepatitis is a liver inflammation that stems from a virus or hepatotoxic agent

(b) Viral hepatitis is the most common of the serious, contagious
diseases caused by a virus that attacks the liver

(c) Hepatitis B & C are classified as sexually transmitted diseases

(d) Types

(i) Hepatitis A - formerly called infectious hepatitis

* Ranks as most common type of hepatitis
* Highly contagious
* Transmitted primarily in food handled by individuals in the infectious stages of the disease is very contagious and often spread within families
* Public health problems occur from contaminated shellfish after raw sewage releases and accidents as well as, from commercial food handlers
* Acute onset
* No treatment has been shown to alter the disease course
* Immunization: An inactivated hepatitis A vaccine is available, Prophylactic IG may be administered within two weeks after exposure to hepatitis A, Persons traveling to Africa, the Middle East, Central and South America, and Asia should be immunized FEMA team personnel should be offered vaccine if they travel out of the United States

(ii) Hepatitis B - formerly called serum hepatitis; most serious form

* A prominent source of acute/chronic hepatitis and cirrhosis of the liver
* Hepatitis B virus is very hardy, the virus' ability to survive outside its normal environment for an extended period of time demonstrates the need for appropriate application of universal precautions
* Signs and symptoms are vague and can be mistaken for influenza or the common cold (fatigue, gastrointestinal disorders, headaches)
* In prehospital care workers, needle stick injuries, mucous membrane contact and open lesions of the skin are the primary mode
* Needle stick injuries are the most common cause of contraction

* Workers are at risk of HBV infection to the extent they are exposed to blood and body fluids
* Modes of transmission are preventable by the application of engineering controls, proper work practices (universal precautions), and HBV vaccination
* Prophylaxis: Hepatitis B vaccine before exposure and Hepatitis B immune globulin after exposure

(iii) Hepatitis C - formerly called non A, non B hepatitis
* Transmission: transfused blood (most common), body fluids
* Individuals at high risk for developing hepatitis C include: Intravenous drug users, renal dialysis patients, multi-transfused patients, hemophiliacs
* Prevention: clean water supply, safe disposal of human waste, hygienic handling of food, good personal hygiene, and medical prophylaxis includes active immunization with Immunoglobulin (1g)
* Treatment: no specific treatment or drug can kill the hepatitis viruses

(3) Acute pancreatitis: inflammation of the pancreas- alcoholism accounts for 80% of all causes
(a) Signs and symptoms
(i) Abrupt onset of epigastric pain, radiating to back
(ii) Nausea, vomiting, sweating, weakness
(iii) Abdominal tenderness and distention
(iv) Fever
(v) May have a history of previous episodes, often related to alcohol abuse
(vi) Jaundice may occur – may be caused by stones
(b) Treatment:
(i) NPO until patient is pain free
(ii) Nasogastric suction
(iii) IV hydration
(iv) Bed rest
(v) Pain control with narcotics IV (by MD/PA order)
(vi) Refer patient to MD/PA
(vii) Evacuate as soon as poss ble

(4) Acute Cholecystitis: acute inflammation of the gallbladder wall, usually as a response to cystic duct obstruction by a gallstone
(a) Signs and symptoms

(i) Steady, severe pain and tenderness in the right upper quadrant or umbilical area. Acute attack is often precipitated by a large, fatty meal.
(ii) Nausea and vomiting
(iii) Painful splinting of respiration during deep inspiration and right upper quadrant palpation (Murphy's sign) is frequent
(iv) Fever

(b) Treatment
(i) NPO
(ii) IV hydration
(iii) Pain control with narcotics IV (by MD/PA order)
(iv) IV antibiotics – as directed by MD/PA
(v) Cholecystectomy usually performed 2-3 days after acute episode subsides
(vi) Refer patient to MD/PA
(vii) Evacuate as soon as poss ble

(5) Cholelithiasis: formation or presence of calculi (gallstones) in the gallbladder.
(a) Signs and symptoms
(i) The clinical consequences of stone formation in the gallbladder are exceedingly variable. Most patients remain asymptomatic for long periods, frequently for life.
(ii) Persistent obstruction usually produces inflammation and acute cholecystitis. Stones in the duct cause colicky pain associated with peristaltic motion.

(b) Treatment: symptomatic gallstones - biliary colic recurs with irregular, pain-free intervals of days or months. Symptomatic patients are at increased risk of developing complications, and cholecystectomy is indicated. Refer to PA/MD and evacuate.

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked M5 Bag or Combat Medic Vest System, IV administration equipment and fluids, oxygen, suction, and ventilation equipment (if available), selected medications, and documentation forms. You encounter a casualty complaining of genitourinary problems. No other injury(ies) are present. Performed initial management interventions for genitourinary symptoms identified during focus history and exam.

Recognize specific illnesses

Cystitis

(1) Definition - inflammation of the urinary bladder

Urine is normally sterile. Bacteria reach the bladder by way of infected kidneys, lymphatics, and the urethra. Because the urethra is short in women, ascending infections are more common in women.

(2) Causes
- (a) Fecal contamination
- (b) Catheters
- (c) Sexual intercourse - occurs after long periods without sexual intercourse. Also called "Honeymoon cystitis“

(3) Symptoms
- (a) Urgency (a feeling of the need to void although the bladder is not full)
- (b) Frequency
- (c) Dysuria (painful urination)
- (d) Perineal and suprapubic pain
- (e) Hematuria
- (f) Chills and fever are rare, but may indicate a more serious illness

(4) Diagnosis
- (a) Patient's history and physical examination
- (a) Urinalysis, urine culture and sensitivity (C&S)—may show an increase in the number of red and white cells, as well as the causative microorganism

(5) Treatment
- (a) Increase fluid intake
- (b) Identify and correct contributing factors
- (c) Antimicrobial therapy as prescribed by the MD/PA
- (d) Urinary (Pyridium) for dysuria

Urethritis

(1) Definition - inflammation of the urethra, more common in men than in women

(2) Causes
- (a) If caused by organisms other than gonorrhea--it is known as nonspecific urethritis (NSU)

(b) Gonorrhea causes a specific form of infection that can attack the mucous membrane of the urethra
(c) Urethritis may accompany cystitis in women
(d) Nonspecific urethritis in men caused by:
(i) Irritation during vigorous intercourse
(ii) Intercourse with an infected partner
(iii) Most common cause of urethritis is caused by chlamydia trachomatis

(3) Symptoms
(a) Dysuria - ranging from slight tickling to burning or severe discomfort
(b) Urinary frequency
(c) Fever is NOT common and implies a more serious infection to prostate, testes, and epididymis in males
(d) Urethral discharge

(4) Diagnosis
(a) Patient's history and symptoms
(b) In men, urethral smear (gram stain)/ C & S to identify causative organism
(c) In women, clean catch urinalysis

(5) Treatment
(a) Antibiotic therapy as prescr bed by the MD/PA. Depending on organism must involve MD/PA as treatment needs to be tailored and treatment of syphilis is also required in many cases.
(b) Increase fluid intake
(c) Analgesics for pain/discomfort

Pyelonephritis

(1) Definition - infection of the renal parenchyma (the functional tissue of an organ as distinguished from supporting or connective tissue) and the lining of the collecting system

(2) Causes
(a) Acute pyelonephritis
(i) Associated with diabetes, pregnancy and extremes of age
(ii) Bacterial infection such as E-coli, streptococcus, pseudomonas, and staph aureus
(iii) More common causes are bladder instrumentation, neurogenic bladder, and inability to completely empty the bladder
(b) Risk factors
(i) Diabetes
(ii) Pregnancy
(iii) Recent instrumentation
(iv) Extremes of age

(3) Symptoms
(a) Acute pyelonephritis
(i) Flank pain

(ii) Chills, fever, and malaise
(iii) Frequency and burning on urination may be present if bladder is also infected.
(iv) Nausea and vomiting, dehydration with secondary
(v) Headache

(4) Diagnosis
(a) Urinalysis positive for leukocyte (WBC's) casts
(b) Positive urine culture
(c) Physical examination reveals CVA (costovertebral angle) or flank tenderness

(5) Treatment
(a) Symptomatic treatment for fever and pain
(b) Antibiotic therapy prescribed by MD/PA. May consider ampicillin. gentamycin or fluoroquinolone (Cipro/Levaquin)
(c) L beral oral fluid intake, if unable to tolerate fluids IV hydration and antibiotics
(d) Relief of any urinary obstruction
(e) All patients need to be evaluated by a physician

NOTE: Damage to the kidney can be life threatening if not treated promptly.

(6) Discharge Teaching
(a) Follow diet and fluid regime as prescr bed
(b) Take medications exactly as directed
(i) Do not omit or discontinue medication unless told by the physician
(ii) Do not take nonprescription drugs unless cleared by the physician

Infections of the female reproductive system

(1) Vaginitis
(a) Definition - inflammation of the vagina (The normal acidity of the vaginal secretion is a natural defense against infection but, if infected by certain pathogenic organisms, an infection results)
(b) Causes
(i) Bacteria- most common
(ii) Trichomonas vaginalis - a protozoan
(iii) Candida a bicans – yeast (fungal)
(c) Facts
(i) Commonly occurs during pregnancy and after antibiotic therapy
(ii) Frequently seen in women with diabetes
(iii) Vaginitis may persist for years
(iv) Factors that influence the development of a vaginal infection include
* A change in the vaginal ph.

* Hormonal changes during the menstrual cycle, pregnancy or for any other reason (such as taking steroids).
* Long-term use of birth control pills
* Use of systemic antibiotics
* Compromised immunity

(d) Types of Vaginitis:
- (i) Bacterial Vaginosis (BV)
  * Known as nonspecific vaginitis.
  * Caused by a combination of organisms.
  * Increased discharge (white, yellow or gray) with a "fishy" odor.
  * Redness or edema not significant.
  * May be sexually transmitted
- (ii) Trichomonas Vaginalis (Trichomoniasis) - a sexually transmitted disease
- (iii) Candidiasis albicans— "typical yeast infection" may be a sexually transmitted disease

(e) Signs and symptoms
- (i) Leukorrhea - whitish or yellow white vaginal discharge
- (ii) Discharge may be frothy or thick
- (iii) Odorous and profuse discharge (more so in trichomoniasis)
- (iv) Perineal, vaginal and urethral burning and itching
- (v) Possible discomfort in lower abdominal region
- (vi) Redness or rash around vagina
- (vii) Painful intercourse
- (viii) Occasionally asymptomatic

NOTE: Diagnosis is made upon microscopic examination of the vaginal discharge (usually a wet prep/KOH) and normal saline.

(f) Treatment
- (i) Metronidazole (Flagyl) if BV or trichomoniasis infection - dose 250mg po tid x7 days or 2gm po in single dose. Instruct patient not to drink alcohol while taking Flagyl and for three days after completion of therapy. Using together will cause nausea, vomiting, headache, cramps and flushing)
- (ii) Nystatin cream (Mycostatin, Nilstat); Miconazole (Monistat, Micatin) Clotrimazole (Mycelex) if candida infection
- (iii) If has glycosuria (glucose in urine), patient will need work-up to rule out the diagnosis of diabetes mellitus

(iv) Women with any of the following clinical situations should notify the physician at the first sign of a vaginal infection
* First vaginal infection
* Unsure if it is a yeast infection
* High risk for HIV or AIDS
* Diabetic
* Temperature over 100 degrees
* Under 12 years of age
* Pregnant
* New onset pain especially lower abdomen, back, or shoulder
* Malodorous vaginal discharge

(2) Pelvic Inflammatory Disease (PID)
(a) Definition - an infection or inflammation of the ovaries, fallopian tubes, uterus, or pelvic cavity
(b) Causes and transmission
(i) Infection usually enters the pelvic organs (uterus fallopian tubes, ovaries) through the cervix and vagina
(ii) Organisms commonly associated with causing PID are N. gonorrhea and Chlamydia
(c) Signs and symptoms
(i) Foul-smelling vaginal discharge
(ii) Back ache
(iii) Pelvic pain
(iv) Abdominal pain
(v) Fever, chills, malaise
(vi) Nausea, vomiting
(vii) Menorrhagia
(viii) Dysmenorrhea
(ix) Dyspareunia
(d) Risk factors
(i) Multiple sexual partners
(ii) History of STDs in the past
(iii) Frequent vaginal douching
(iv) IUD (intrauterine device for contraception)- highest risk first four months after insertion
(v) Younger age
(e) Diagnosis
(i) Based on symptoms and physical exam findings-lower abdominal pain is the most frequent presenting complaint
(ii) Wet prep (saline/KOH (potassium hydroxide) of vaginal secretions)
(iii) Culture and sensitivity of vaginal discharge to determine causative organism
(iv) Ultrasound if available
(v) This is a cause of serious illness and death if not treated quickly and properly – Patient may

develop toxic shock syndrome that can be rapidly fatal.

(f) Treatment
  (i) Serious illness that requires hospitalization for administration of IV antibiotics and supportive care Patient must be treated quickly and properly.
  (ii) IV antibiotics as prescr bed by the MD/PA
  (iii) During the active disease process, douches and sexual intercourse should be avoided
  (iv) Remove IUD if in place
(g) Discharge Teaching:
  (i) Both sex partners must be instructed to take their prescribed medications even though one partner may be asymptomatic

Kidney Stones

(1) Stones form throughout the urinary system. Patients usually present when the stone has migrated into a ureter
(2) Cause
  (a) Dehydration
  (b) Increase in minerals in water supply
  (c) Occurs three times more often in males than females
(3) Symptoms
  (a) Acute onset of severe flank pain
  (b) Flank pain radiates to the groin, scrotum or labia
  (c) Nausea, vomiting, secondary dehydration, anxious
  (d) Cool clammy skin, diaphoresis, tachycardia and increased blood pressure due to severe pain
  (e) Hematuria with dysuria, urinary frequency
(4) Diagnosis
  (a) Urine analysis – hematuria
  (b) Physical assessment - acute CVA /flank tenderness on affected side
  (c) Fever and/or hypotension are unusual and would suggest possibility of infection or diagnosis other than renal colic
(5) Differential Diagnosis
  (a) Aortic dissection
  (b) Abdominal aortic aneurysm
  (c) Renal obstruction
  (d) Acute myocardial infarction
  (e) Acute abdomen
(6) Treatment
  (a) Pain control-IV narcotics almost always required
  (b) IV hydration
  (c) Strain all urine to recover stone, if passed
  (d) Refer immediately to nearest MTF for management

Acute scrotal pain

(1) Differential Diagnosis
- (a) Testicular torsion
  - (i) Cause
    - * History of athletic event or trauma
  - (ii) Symptoms
    - * Pain is sudden and severe with radiation into abdomen
  - (iii) Diagnosis
    - * Malpositioned testes-lateral orientation and elevated
    - * Ultrasound
  - (vi) Treatment
    - * Immediate referral to the nearest treatment facility
    - * Manual detorsion of the affected testis may be attempted. This is accomplished standing at the foot of or on the right side of the patient's bed. The torsed testis is detorsed in a fashion similar to "opening a book". That is, the patient's right testis is rotated in a counterclockwise fashion and the patient's left testis in a clockwise fashion.
    - * Surgical Emergency – patient will lose testicle if torsion is not corrected
- (b) Epididymitis
  - (i) Cause
    - * Bacterial infection, often STD
    - * Urinary tract infection
    - * Prostatitis
    - * Prolonged use of indwelling catheters
  - (ii) Signs and symptoms
    - * Pain more gradual than onset of torsion
    - * Causes lower abdominal, inguinal and scrotal or testicular pain alone or in combination
  - (iii) Diagnosis
    - * Painful urination
    - * Transient relief of scrotal/testicular pain in the recumbent position with scrotal elevation
    - * Pyuria (WBC's and bacteria) on urinalysis
    - * Epididymis tender on palpation. May feel like a 'bag of worms"
  - (iv) Management

* Antibiotic therapy as prescr bed by MD/PA
* Increase fluid intake – oral or IV
* Rest with scrotal elevation
* Oral analgesics

Sexual Assault Assessment

(1) 5% of violent crimes in U.S.
  (a) Much higher incidence in 3rd world countries
  (b) Grossly under reported
(2) Assessment
  (a) Assess for and treat any life-threatening injuries (compromised airway, hypovolemic shock)
  (b) Provide "safe“ environment –shield from other patients, visitors
  (c) Avoid touching patient without permission
  (d) Tell patient not to shower, bathe, change clothes or throw clothes away until examined by the physician. Evidence preservation is paramount.
  (e) Notify MD/PA immediately

Recognize Sexually Transmitted Diseases

Factors that contribute to Sexually Transmitted Diseases (STD)

(1) Unknown carrier of disease
(2) Casual sex
(3) Absence of laws that require reporting of ALL STDs
(4) Length of time between exposure and appearance of symptoms (or positive ant body tests)
(5) Failure to:
  (a) Recognize signs and symptoms
  (b) Seek early treatment
  (c) Refrain from sexual activity until treatment complete
(6) Lack of knowledge regarding STDs and their prevention
(7) Failure of sexually active person to heed STD warnings

Factors related to prevention and control of STDs

(1) Public education:
  (a) School Systems
  (b) Television and newspapers
(2) Refrain from sexual activity until disease eradicated
(3) Locate and treat contacts
(4) Continued research
(5) STD clinics

Chlamydia (Appears 7-10 Days after exposure)

(1) Caused by the organism, Chlamydia trachomatis (parasite)
(2) Signs and Symptoms
  (a) Urethritis & epididymitis in men
  (b) Cervicitis & macopurulent discharge in women
  (c) Some patients may be asymptomatic, especially women
  (d) Can be transmitted from mother to infant at birth
  (e) Additional problems
    (i) Pelvic inflammatory disease
    (ii) Ectopic pregnancy
    (iii) Sterility
    (iv) Systemic infections
(3) Diagnosis
  (a) Direct microscopic examination-will observe flagellated parasite
  (b) Culture of secretions or tissue scrapings
(4) Management
  (a) Antimicrobials, such as tetracycline, erythromycin, sulfonamide as prescribed by MD/PA
  (b) Explain the prescribed treatment
    (i) Length of treatment is 7-21 days
    (ii) Patient should refrain from sexual activity during treatment
  (c) Referral to Preventative Medicine for reporting

NOTE: Treatment failure can be due to either reinfection or patient noncompliance with antimicrobial therapy.

Gonorrhea

(1) Caused by the organism Neisseria gonorrhea. Often co-exists with chlamydial infections.
(2) Signs and Symptoms
  (a) Appear 2 to 6 days after exposure
  (b) Men
    (i) Urethritis with a purulent discharge.
    (ii) Pain on urination
    (iii) May spread to prostate, seminal vesicles, epididymis
    (iv) Sometimes there are no symptoms in men
    (v) Gonococcal infection occur in the pharynx and rectum
  (c) Women
    (i) Vaginal discharge
    (ii) Abnormal menstrual bleeding
    (iii) Painful urination
    (iv) 80% experience no symptoms
(3) Diagnosis
  (a) Gram stain and culture

(b) In men, specimen of urethral discharge is obtained; anal and pharyngeal smears if person has practiced anal or oral sex.
(c) In women, specimen obtained from cervix

NOTE: Lubricants are not used on speculum because these products may destroy the gonococci.

(4) Management
(a) Antibiotics as prescr bed by MD/PA. Rocephin 250 mg IM is usually effective treatment
(b) Explain the treatment regimen
(c) Explain the importance of contacting all sexual partners for examination and treatment
(d) Refrain from sexual activity until follow-up smears are negative
(e) Referral to Preventative Medicine for reporting

Syphilis

(1) Caused by spirochete, Treponema pallidum. If untreated, progresses through secondary & tertiary stages.
(2) Signs and Symptoms
(a) Primary (early) stage (Appears 2-6 weeks after exposure)
(i) Chancre appears on genitals, anus, cervix, and other parts of body.
(ii) Chancre first resembles papule, later appears ulcerated, painless
(iii) Heals by itself in several weeks
(b) Secondary Stage: (Appears 2-6 weeks after primary stage)
(i) Fever
(ii) Malaise
(iii) Rash – most common manifestation
(iv) Headache
(v) Sore throat
(vi) Enlarged lymph nodes
(c) Tertiary Stage: Non-infectious – involvement of the nervous and cardiovascular systems
(i) May occur years after initial infection. Sometimes as much as twenty years later.
(3) Diagnosis
(a) Lab tests (serum)
(i) VDRL - Venereal Disease Research Laboratory
(ii) RPR - Rapid Plasma Reagent
(iii) Fluorescent treponemal ant body absorption test
(4) Management
(a) Explain the treatment regimen
(b) Instruct the patient to avoid intercourse until permitted
(c) Primary and secondary stages
(i) Penicillin G - drug of choice

(ii) Tetracycline or erythromycin - if allergic to penicillin
(iii) Follow-up examination at 3,6, & 12 months

(d) Tertiary stage:
(i) Larger doses of penicillin G
(ii) Response is poor in patients with cardio-vascular syphilis

Herpes Genitalis

(1) Caused by Herpes Simplex Virus
(2) Signs and Symptoms
(a) Painful vesicular lesions on buttocks, penis, perineum, vulva, cervix, vagina (if transmitted by anal intercourse, lesions may appear in rectum and perianal area).
(b) Lesions may persist for several weeks
(c) Malaise
(d) Fever
(e) Chills
(f) Headache
(g) Reoccurrence in 60 – 90 % of patients
(3) Diagnosis
(a) Examination of lesions-linear vesicles. Microscopic exam will show giant cells.
(b) Viral culture
(4) Management
(a) Acyclovir (Zovirax) - oral, topical, intravenous

NOTE: Acyclovir may decrease the frequency and magnitude of reoccurrences.

(b) Analgesics for pain and discomfort
(c) If eye infection, use Vira-A, Herpes Liquafilm or Viroptic
(d) Instruct the patient to use a condom at all times if there is a periodic reoccurrence of the lesions
(e) Refrain from sexual intercourse or use a condom
(f) Pregnant women must inform the physician if they have a history of herpes. Delivery during an active outbreak can be fatal to the infant.

Genital Warts

(1) Caused by human papilloma virus (HPV)
(2) Signs and Symptoms
(a) Incubation period is normally 1-2 months, but may be longer
(b) Painless, soft, fleshy wart-like growths on the genitalia or cervix or in vagina
(3) Diagnosis: visual examination
(4) Management

(a) No cure
(b) RPR for syphilis
(c) Treat with podophyllin, a topical solution that is left in place for 4-6 hours, and then washed off
(d) Teach the patient to use a condom

NOTE: There appears to be an increased risk of cancer of the vulva, cervix, and vagina in women with genital warts.

Review Male and Female Catheterization

Urinary Catheterization

(1) Definition - Insertion of a catheter (tube for injecting or removing fluids) through the urethra into the bladder for the purpose of removing urine.
(2) Purposes of Urinary Catheterization
(a) Relieve urinary retention
(b) Obtain sterile urine specimen from female
(c) Measure amount of residual urine in bladder (an amount greater than 50 ml is considered abnormal)
(d) Empty bladder before, during, and after surgery
(e) To obtain a urine specimen when a specimen cannot be obtained by any other means
(3) Urinary Catheter Sizes
(a) The smaller the number, the smaller the catheter
(b) No. 8 Fr and 10 Fr - used for children
(c) No. 14 Fr and 16 Fr - used for female adult
(d) No. 18 Fr, 20 Fr - usually used for male adult

NOTE: Larger size catheter used for male because it is stiffer, thus easier to push the distance of the male urethra.

Types of Urinary Catheters

(1) Intermittent catheter
(a) Used to drain bladder for short periods (5-10 min)
(b) Commonly used for self-catheterization by patients in the home environment (after proper amount of training)
(c) Commonly used with spinal cord injury patients
(2) Indwelling/retention catheter
(a) Continuous bladder drainage
(b) Gradual decompression of over-distended bladder

NOTE: Do not remove more than 750cc to 1000cc of urine from the bladder at any one time. Gradual decompression will prevent bladder damage and shock.

(c) Intermittent bladder drainage and irrigation
(d) Drainage tube and collection device connected to this type of catheter

(e) Most commonly used indwelling catheter is a Foley catheter
(i) Designed with balloon at distal tip which can be inflated with sterile water or saline
(ii) Inflated balloon keeps catheter from slipping out of bladder

(3) Supra pubic catheter
(a) Inserted into bladder through small incision above pubic area
(b) Occasionally used for continuous drainage

Procedure for the insertion of Foley Catheter in the male and female patient

It is important to remember that the bladder normally is a sterile cavity and the external opening to the urethra can never be sterilized. Pathogens introduced into the bladder can ascend the ureters and lead to bladder and kidney infections.

(1) Gather all equipment - wash hands
(a) Sterile catheterization kit
(b) Flashlight or lamp
(c) Urine collection bag
(d) Velcro leg strap or anchoring tape
(e) Disposal bag
(f) Waterproof pad or chux

(2) Explain procedure to patient. He/she may experience a burning/pressure sensation as the catheter is inserted, and a feeling of needing to void, once catheter is in place

(3) Provide for adequate lighting

(4) Provide for privacy

(5) Position patient
(a) Males - assist patient into supine position with thighs slightly apart. First place waterproof pad under patient's buttocks. Drape patient so only penis is exposed.
(b) Females - assist patient to dorsal recumbent position with knees flexed and about 2 feet apart. Females may also be positioned in the Sim's or lateral position with upper leg flexed. Place waterproof pad under patient.

(6) Cleanse genital and perineal areas with soap and water. Rinse and dry. Wash hands.

(7) Open sterile catheterization tray and supplies, using sterile technique.

(8) Put on sterile gloves. Open sterile drape and place on patient's thighs. Place drape with opening over penis (males) or labia (females).

(9) Place catheter set on or next to patient's legs on sterile drape.

(10) For indwelling catheters, test catheter balloon:
(a) Attach pre-filled irrigation syringe to injection port
(b) Inject appropriate amount of fluid

(c) If balloon inflates properly, withdraw fluid and leave syringe attached to port

(11) Pour antiseptic solution over cotton balls

(12) Lubricate catheter for about 6 to 7 inches (males) or 1-2 inches (females)

(13) Insertion of Catheter

(a) Males

(i) Lift penis with non-dominant hand, which is then considered contaminated.

(ii) Retract foreskin in uncircumcised male

(iii) Cleanse area at meatus with a cotton ball that is held with forceps

(iv) Use circular motion, moving from meatus toward base of penis. Repeat this three times

(v) Hold penis with slight upward tension and perpendicular to patient's body

(vi) Instruct patient to bear down as if voiding

(vii) With dominant hand, place drainage end of catheter into receptacle (if pre-attached to drainage bag, place bag close to sterile field)

(viii) Insert catheter tip into meatus

(ix) Advance tip 6 to 8 inches until urine flows

(x) Do not use force to introduce catheter

(xi) For slight resistance, ask patient to take a deep breath and rotate catheter slightly

(xii) Once urine drains, advance catheter another 1/2 to 1 inch

(xiii) Inflate the balloon with the pre-filled syringe

(b) Females

(i) With thumb and one finger of non-dominant hand, spread labia and identify meatus. Maintain separation of labia with one hand

(ii) Using antiseptic soaked cotton balls held with forceps, cleanse area from clitoris toward anus, using a different sterile cotton ball each time-first to the right of the urinary meatus, then to the left of the urinary meatus then down the center over the urinary meatus. Discard each cotton ball after one downward stroke.

(iii) With sterile gloved hand, place drainage end of catheter into receptacle. (If pre-attached to drainage bag, place bag close to sterile field)

(iv) Insert catheter tip into meatus 2 to 3 inches or until urine flows.

(v) Do not use force to push catheter through urethra into bladder

(vi) For slight resistance, ask patient to take a deep breath and rotate catheter gently as it reaches external sphincter.

(vii) Once urine drains, advance catheter 1/2 to 1 inch
(viii) Inflate the balloon with the prefilled syringe

(14) Check to insure balloon is properly filled:
(a) Tug gently on catheter to feel for resistance
(b) Attach catheter to drainage system if required

(15) Secure catheter to upper thigh (males and females) or lower abdomen with penis directed toward patient's chest (males). Leave some slack in catheter to prevent tension.

(16) Secure drainage bag below level of bladder. Check that tubing is not kinked and movement of side rails does not impede drainage.

(17) Cleanse and dry perineal area

(18) Remove equipment and make patient comfortable

(19) Wash your hands

(20) Document procedure in record
(a) Type and size of catheter
(b) Time of catheterization
(c) Amount of urine removed
(d) Description of urine
(e) Client's reaction to procedure
(f) Client's teaching and level of understanding

Removing a Retention Bladder Catheter

(1) Assemble all equipment
(a) 10 cc syringe
(b) Waterproof drape
(c) Soap and water
(d) Exam gloves
(e) Privacy drape

(2) Explain procedure to patient, and advise that he/she may feel a slight burning sensation during removal of the catheter and the first time or two that they void.

(3) Provide for privacy and assist female patient to a dorsal recumbent position, or the male patient to a supine position.

(4) Place waterproof drape under patient's buttocks and provide a drape for patient privacy.

(5) Wash hands and don disposable gloves

(6) Remove securing tape on catheter

(7) Attach syringe to balloon valve and aspirate entire amount of water from balloon. Check size of balloon so you know how much to remove.

(8) Encourage patient to take deep breath and relax while gently removing catheter per ward SOP. Wrap catheter in towel or disposable waterproof drape.

(9) Clean the perineal area after the catheter is removed.

(10) Remove gloves and wash hands

(11) Reposition patient comfortably

(12) Instruct patient to drink plenty of fluids, if appropriate. Record intake and output, and instruct patient regarding need to void into bedpan or urinal.
(13) Inform patient that it may take a while for bladder to reestablish voluntary control, and that an accident is not unusual.
(14) Discard equipment and return it to appropriate area
(15) Record procedure, including the following
  (a) Time of procedure
  (b) Description and amount of urine in drainage bag
  (c) Record all patient teaching accomplished and patient's level of understanding
(16) Record and report any unusual signs to the charge nurse. These include, but are not limited to:
  (a) Discomfort
  (b) Bleeding
  (c) Change in vital signs (Increased pulse/decreased BP)
  (d) Increase in temperature
  (e) Strong odor

Care of the patient with an indwelling urinary catheter

(1) Catheter care
  (a) Wash hands before and after catheter care
  (b) Clean perineal area and proximal third of catheter twice a day and after bowel movements. Use soap and water, or designated solution per hospital SOP. Do not use powders or lotions, rinse well.
  (c) Note color, character and odor of urine
    (i) Empty catheter bag every 8 hours or as directed by SOP/physician's order
    (ii) Ensure drainage spout does not contact contaminated surface.
    (iii) Measure and record I&O as ordered
    (iv) Observe patient for fever, chills or a sudden onset of pain
    (v) Apply topical antibiotic ointment to meatus, as ordered
    (vi) Check catheter frequently for patency and drainage of urine
    (vii) Secure catheter to patient to avoid pulling or pressure
    (viii) Clamp catheter temporarily if urine bag must be elevated higher then bladder. This prevents urine from draining back into bladder.
    (ix) Drainage system tubing should extend straight down from bed to drainage bag

NOTE: Any loops hanging down from bed level may promote stasis of urine, leading to infection.

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked M5 Bag or Combat Medic Vest System, oxygen, suction and ventilation equipment (if available). You encounter a casualty with symptoms of a skin disorder. No other injury (ies) or anaphylaxis symptoms are present, treat skin disorders IAW *Basic Trauma Life Support*, *Emergency Care in the Streets*, *Adult Health Nursing*, *Basic Nursing: A Critical Thinking Approach*, *Habif's Clinical Dermatology*

Assess for Skin Disorders

Temperature

Skin color

(1) Lips
(2) Oral membranes
(3) Sclera
(4) Conjunctiva
(5) Palms and soles of feet

Skin integrity - palpate with gloved hands

(1) Is the skin intact or not?
(2) Texture (e.g., smoothness, and roughness)

Moist/dry

Skin lesion identification:

(1) **Primary lesions** are early skin changes that have not yet undergone natural evolution or change caused by manipulation. These are the best clues to diagnosis.
  (a) A macula is flat; color varies from white to brown to red to purple, and small (< 1 cm). A patch is a large macule (> 1 cm). Examples include freckles, flat moles, and tattoos.
  (b) A papule is a solid, elevated lesion usually < 1 cm. A plaque is a plateau-like lesion > 1 cm or a group of confluent papules. Examples include warts, some moles and some types of skin cancer
  (c) A nodule is a palpable, solid lesion >1-2 cm, elevated. Larger nodules (>2 cm) are called tumors. Examples include cysts or lipomas
  (d) A vesicle is a circumscribed, elevated lesion containing serous fluid that is < 1 cm; if > 1 cm, it is called a bulla (blister). Vesicles or bullae are commonly caused by primary irritants, allergic contact dermatitis, physical trauma, sunburn, insect bites
  (e) Pustules are superficial and elevated lesions containing pus < 1 cm. They may result from infection or seropurulent evolution of vesicles or bullae. Some causes are impetigo, acne and folliculitis
  (f) Wheals (hives) are transient, elevated lesions caused by localized edema. Wheals are a common allergic reaction,

e.g., from drug eruptions, insect stings or bites, or sensitivity to cold, heat, pressure, or sunlight.

(g) Purpura is a general term referring to areas of extravasated blood. Petechiae are small-circumscribed punctate foci of extravasation, whereas ecchymoses (bruising) are larger confluent areas of extravasation. The term hematoma refers to an area of massive bleeding into the skin and underlying tissues

(8) Telangiectasias are dilated superficial blood vessels. They appear as red, threadlike lines. They may occur in certain systemic diseases or in long-term therapy with topical corticosteroids

(2) Secondary lesions result when primary lesions undergo a natural evolution

(a) Scales are particles of epithelium. Common scaling diseases are psoriasis and superficial fungal infections

(b) Crusts (scabs) consist of dried serum, blood, or pus. Crusting occurs in many inflammatory and infectious diseases

(c) Erosion is focal loss of part or all of the epidermis. It often occurs with herpes viral diseases

(d) Ulcers are focal loss of the epidermis and at least part of the dermis. When ulcers result from physical trauma or acute bacterial infection, the cause usually is apparent. Less obvious causes include chronic bacterial and fungal infections

(e) Excoriation is a linear or hollowed-out crusted area caused by scratching, rubbing, or picking

(f) Lichenification is a thickened skin area with accentuated skin markings

(g) Atrophy manifests as paper-thin, wrinkled skin. It occurs in the aged, after long-term use of topical potent corticosteroids, and sometimes after burns

(h) Scars are areas of fibrous tissue that replace normal skin after destruction of some of the dermis. Scars may be caused by burns or cuts or less commonly by systemic diseases

Presence of skin lesions

(1) Identify type of lesion

(2) Excretions

(a) Color, odor, amount

(b) Thick, oily etc.

(3) Size, does it change over time?

(4) Location

Turgor and mobility

(1) Turgor checks the hydration status of the patient

(2) Pinch skin to form dent on back of patient's hand, abdomen, or sternum. Release skin and note how long it takes to return to normal position

Edema

(1) Common sites are - face, eyelids, ankles, feet, sacral and scapular area
(2) Indications of edema are - skin puffiness, tautness, or hardness
(3) Types of edema - press in on area with thumb for 5 seconds and release
  (a) Trace or shallow - slight indention that disappears (1+ second)
  (b) Pitting - deep indentation that remains visible for several seconds (3-4 + seconds)
  (c) Dependent - gravity causes fluid to pool in areas lowest to the earth.

Identify and Manage Viral Disorders of the Skin

Herpes simplex:

An infection from the herpes simplex virus (HSV) is characterized by one or many clusters of small vesicles filled with clear fluid on slightly raised inflammatory bases

(1) Signs and symptoms
  (a) The lesions may appear anywhere on the skin or mucosa but are most frequent around the mouth, on the lips, on the conjunctiva and in the genital area
  (b) Incubation period is 2-20 days. Asymptomatic „carriers“ shed the virus and spread the disease
  (c) After a prodromal period; tingling, discomfort or itching and small tense vesicles appear on an erythematous base
  (d) Single clusters vary in size from 0.5 to 1.5 cm, but groups may coalesce
  (e) The vesicles persist for a few days, and then begin to dry, forming a thin yellowish crust or ulcer
  (f) Primary (initial) infection is generally the most severe, with fever, lymphadenopathy and urinary symptoms (if the outbreak is genital)
  (g) A herpetic whitlow is a HSV infection of the fingers, resulting from an inoculation of HSV through a cutaneous break. Common in health care workers. Symptoms include swelling and pain over lesions around the finger nail.
(2) Treatment
  (a) Healing generally occurs in 8 to 12 days after onset
  (b) Individual herpetic lesions usually heal completely, but recurrent lesions at the same site may cause atrophy and scarring

(c) Antiviral medications (acyclovir) are used for initial outbreaks, recurrent infections and suppressive therapy
(d) Secondary bacterial infections are treated with systemic antibiotics
(e) Avoid sexual intercourse while genital lesions are present. Viral shedding may occur even if patient is symptom free. Discuss condom usage with all genital herpes patients
(f) Refer the patient to a MD/PA for treatment

Herpes zoster

(Shingles) An infection with varicella-zoster virus primarily involving the dorsal root ganglia and characterized by vesicular eruption and neuralgic pain in the dermatome of the affected root ganglia

(1) Signs and symptoms
(a) Pain along the site of the future eruption usually precedes the rash by 2 to 3 days
(b) Characteristic crops of vesicles on an erythematous base then appear, following the cutaneous distribution of one dermatome
(c) The involved zone is usually hyperesthetic, and pain may be severe
(d) Eruptions occur most often in the thoracic or lumbar region and are unilateral
(e) Lesions usually continue to form for about 3 to 5 days
(f) Crusting occurs by 7-10 days and resolves by 14-21 days
(2) Treatment
(a) Locally applied wet compresses are soothing, but systemic analgesics are often necessary
(b) Oral antiviral medications are used for treatment of herpes zoster
(c) Refer the patient to a MD/PA for treatment

Identify and Manage Bacterial Disorders

Cellulitis-

An acute infection of the skin and subcutaneous tissues. It may arise from an entry of bacteria through the skin (i.e. laceration, puncture wound) or extension from an abscess. Cellulitis is a serious disease because of the poss bility of the infection spreading to the lymphatic and blood systems resulting in bacteremia and sepsis.

(1) Signs and Symptoms
(a) Infection is most common in the lower extremities
(b) The major findings are local erythema and tenderness, frequently with lymphangitis and regional lymphadenopathy
(c) The skin is hot, red, and edematous

(d) Vesicles and bullae may develop and rupture, occasionally with necrosis of the involved skin
(e) Systemic manifestations (fever, chills, tachycardia) may precede the cutaneous findings by several hours, but many patients do not appear ill
(f) Local abscesses form occasionally, requiring incision and drainage

(2) Treatment
(a) Oral ant biotic therapy to cover streptococci and staphylococci is required as first line outpatient therapy. Keflex 500 mg four times a day or Dynapen 500 mg four times a day. For penicillin allergic patients; Erythromycin 500mg four times a day is generally used. Duration of therapy is 10-14 days.
(b) For severe infections, which require hospitalization, Ancef 2 grams intravenously four times a day is used. For penicillin allergic patients, clindamycin 150-300 mg intravenously is given
(c) Immobilization and elevation of the affected area help reduce edema, and cool, wet dressings relieve local discomfort
(d) Refer patient to MD/PA for treatment

Impetigo: Impetigo is a superficial skin infection

(1) Signs and Symptoms: Impetigo may occur on normal skin, especially on the legs in children. Impetigo usually occurs near the lips or nasolabial folds
(a) Lesions initially are pea-sized papules, becoming vesicular and rupturing, leaving the classic „honey-colored crusts“
(b) Regional lymphadenopathy is seen in the majority of cases
(c) Constitutional symptoms are absent

(2) Treatment
(a) Application of mupirocin ointment 3 times daily has been effective in treating impetigo
(b) Patients showing no response to mupirocin in 3 to 5 days should be treated systemically. Because most cases are caused by either streptococci or staph- erythromycin is the drug of choice. Adults are given 250 mg four times a day
(c) Impetigo is extremely contagious. Avoidance of patients' towels or linens is crucial to avoid the spread of infection
(d) Refer patient to MD/PA for treatment

Cutaneous Abscesses:

(1) Signs and symptoms include localized collections of pus causing fluctuant soft tissue swelling surrounded by erythema.

(2) Treatment

(a) Incision of the fluctuant area, thorough draining of pus with meticulous probing
(b) Pack the cavity loosely with a gauze wick that is removed 24 to 48 h later
(c) Local heat and elevation may resolve tissue inflammation
(d) Refer patient to MD/PA for incision and drainage

Folliculitis:

Superficial or deep bacterial infection and inflammation of the hair follicles
(1) Signs and symptoms
(a) A superficial pustule or inflammatory nodule surrounding a hair follicle
(b) The condition may follow or accompany other skin infections
(c) Chronic low-grade irritation or inflammation without significant infection may occur when stiff hairs in the bearded area emerge from the follicle, curve, and reenter the skin (pseudofolliculitis barbae)
(2) Treatment
(a) Topical antibiotics and antiseptics (e.g., chlorhexidine) may be useful adjuncts to systemic therapy but should not be used without concomitant systemic treatment
(b) Treatment with systemic antibiotics may be indicated
(c) Refer patient to MD/PA for treatment

Furuncle (Boil)

Acute, tender, perifollicular inflammatory nodules resulting from infection by staphylococci. The condition often occurs in healthy young persons.
(1) Signs and symptoms
(a) Furuncles occur most frequently on the neck, breasts, face, and buttocks but are most painful when on skin closely attached to underlying structures (e.g., on the nose, ear, or fingers)
(b) The initial nodule becomes a .5-2 cm pustule that discharges a core of necrotic tissue and pus
(2) Treatment
(a) Incision and drainage or application of liquid soap containing either chlorhexidine gluconate with isopropyl alcohol or 2 to 3% chloroxylenol, which may be prophylactic but is not therapeutic
(b) A single furuncle is treated with intermittent hot compresses to allow the lesion to point and either drain spontaneously or incised and drained
(c) Facial furuncles should be managed closely, due to the possibility of retrograde spread of infection through cranial channels
(d) Patients with furuncles are usually treated with systemic antibiotics. Usually a penicillinase-resistant penicillin is

required, such as cloxacillin 250 to 500 mg P.O. qid, or a cephalosporin, such as cephalexin in the same dosage

(e) Refer patient to MD/PA for treatment

Carbuncle

A cluster of furuncles with subcutaneous spread of staphylococcal infection, resulting in deep suppuration, often extensive local sloughing, slow healing, and a large scar

(1) Signs and symptoms
  (a) Carbuncles occur most frequently in males and most commonly on the nape of the neck
  (b) Carbuncles develop more slowly than single furuncles and may be accompanied by fever and prostration
(2) Treatment is the same as for clusters of furuncles (see above)
(3) Refer patient to MD/PA for treatment

Bites

1-3 million animal bites to humans occur annually in the U.S. Dog bites represent 70-90% of all bites. Cat bites represent 7-20% and have a higher incidence of infection. Human and rodent bites make up the remainder of bites.

(1) Signs and symptoms
  (a) The extremities are involved in 75% of cases when victims handle or attempt to avoid the animal. Head and neck injuries are the next most common
  (b) Wounds should be described as to size, location and type. Include diagrams. If infected, describe adenopathy and diagram extent of cellulitis
  (c) These organisms are resistant to many antibiotics but are generally sensitive to ampicillin and penicillin
  (d) All bite injuries are potentially dangerous and can cause significant infection
(2) Treatment
  (a) Wash with warm soapy water
  (b) Provide aggressive and meticulous wound care
  (c) Provide tetanus prophylaxis, as indicated
  (d) Systemic antibiotics for anaerobic and aerobic organisms are given. The type of antibiotic given is dependent on type of animal involved
  (e) Review rabies postexposure prophylaxis guidelines. Exposure is defined as an open bite or wound in contact with body fluids
  (f) Review for possibility of hepatitis B or C transmission in human bites and provide immunoprophylaxis if necessary
  (g) Refer all bite wounds to a MD/PA for assessment and treatment

Felon

Infection of the distal fat pad of a digit. The most common site is the distal pulp, which may be involved centrally, laterally, and apically. Staph aureus is the usual bacteria involved

(1) Signs and symptoms
  (a) The area between pulp spaces ordinarily limit the spread of infection, resulting in an abscess, which creates pressure of adjacent tissues
  (b) The underlying bone, joint, or flexor tendons may become infected, and intense throbbing pain and a swollen pulp are present
(2) Treatment
  (a) Treatment involves prompt incision and drainage
  (b) Systemic antibiotics are generally given
  (c) Wound should be checked in 1-3 days
  (d) Refer patient to MD/PA for treatment

Identify and Manage Inflammatory Disorders

Contact Dermatitis

Contact dermatitis can be subdivided into allergic contact dermatitis and irritant contact dermatitis

(1) Primary irritants may damage normal skin or irritate existing dermatitis
(2) Allergic contact dermatitis patients may become allergic to substances that they have sometimes used for years or to drugs used to treat skin diseases
(3) Examples of agents that may cause contact dermatitis
  (a) Medications- topical
  (b) Plants-poison oak, poison ivy
  (c) Chemicals used in the manufacture of shoes and clothing, metal compounds, dyes, and cosmetics
  (d) Industrial agents
  (e) Sensitivity to rubber and latex in gloves is a particular problem for many health professionals
  (f) Sensitivity to latex condoms may preclude their use in some men
  (g) Photodermatitis occurs after sunlight exposure of a patient wearing photosensitizers that exaggerates the suns effect. Aftershave lotions, sunscreens, and topical sulfonamides are commonly responsible for photoallergic contact dermatitis
  (h) Perfumes
(4) Signs and Symptoms
  (a) Transient redness to severe swelling with bullae
  (b) Pruritus and vesiculation are common

(c) Any skin surface exposed to an irritant or sensitizing substance
(d) Typically, the dermatitis is limited to the site of contact but may later spread
(e) Vesicles and bullae may rupture, ooze, and crust
(f) As inflammation subsides, scaling and some temporary thickening of the skin occur
(g) Continued exposure to the causative agent (e.g., irritation from or allergy to a topical drug, excoriation, and infection) may perpetuate the dermatitis

(5) Diagnosis
(a) Typical skin changes and a history of exposure facilitate diagnosis
(b) The patient's occupation, hobbies, household duties, vacations, clothing, topical drug use, cosmetics, and spouse's activities must be considered
(c) Knowing the characteristics of irritants or topical allergens and the typical distribution of lesions is helpful
(d) The site of the initial lesion is often an important clue

(6) Treatment: Unless the causative agent is identified and removed, treatment will be ineffective. Patients with photodermatitis should also avoid the photosensitizing chemical or exposure to light
(a) In acute dermatitis, gauze or thin cloths dipped in water and applied to the lesions (30 min 4 to 6 times/day) are soothing and cooling
(b) An oral corticosteroid (e.g., predispose 60 mg/day) may be given (if not contraindicated) for 7 to 14 days in extensive cases, or even in limited cases when facial inflammation is present. The prednisone dose can be decreased by 10 to 20 mg q 3 to 4 days
(c) Topical corticosteroids are not helpful in the blistering phase, but once the dermatitis is less acute, a topical corticosteroid cream or ointment can be rubbed in gently three times daily
(d) Antihistamines are ineffective in suppressing allergic contact dermatitis but help the itch

Pruritus (Itching)

A sensation that the patient instinctively attempts to relieve by scratching or rubbing

(1) Etiology: Pruritus is a symptom and not a disease. It may accompany a primary skin disease or a systemic disease. Skin diseases causing severe pruritus and lesions include scabies, pediculosis, insect bites, urticaria, atopic dermatitis, and contact dermatitis

(2) Systemic conditions that cause generalized pruritus, usually without skin lesions, include
- (a) Liver disease
- (b) Kidney disease
- (c) Uremia-excessive amounts of urea and other waste products in the blood
- (d) Pregnancy
- (e) Medications

(3) Signs and symptoms:
- (a) Persistent scratching may produce redness, linear urticarial papules, and excoriation of preexisting papules, fissures, and elongated crusts along scratch lines, which may obscure the underlying disease
- (b) Lichenification and pigmentation may also result from prolonged scratching and rubbing. Occasionally, patients who complain of severe generalized pruritus have few signs of scratching or rubbing the skin

(4) Treatment: The cause of generalized pruritus should be sought and corrected. If no skin disease is apparent, a systemic disorder or drug-related cause should be sought
- (a) If feasible, all drugs should be stopped
- (b) Clothing that is irritating (e.g., woolens) or tight should be avoided
- (c) Bathing should be brief, as it may aggravate generalized pruritus, especially if the patient has dry skin; lukewarm (not hot) water should be used
- (d) Emollients (e.g., white petrolatum or other oil-based products) are good moisturizers to apply after bathing while the skin is still wet (excess water should be blotted)
- (e) Topical corticosteroids seldom alleviate generalized pruritus (without dermatitis) but may be useful if used with lubricants in elderly patients with dry skin
- (f) If a drug has been ruled out as the cause of pruritus, hydroxyzine (10 to 50 mg P.O. q 4 h prn) may be prescribed. If antihistamines are helpful, their sedative effect may be the reason

Bulla (blister)

(1) Definition - a large blister or skin vesicle filled with fluid below the epidermis
(2) Causes
  (a) Thermal or chemical burns (2nd degree)
  (b) Friction or pressure (e.g., poorly fitted shoes, rug burn)
  (c) Ruptured blood vessels due to trauma
  (d) Herpes simplex (fever blister)
(3) Signs and symptoms
  (a) Large elevated fluid filled lesion greater than 1 cm in diameter
  (b) Discoloration at borders of blister, may be red or pale pink
  (c) Pain and tenderness with palpation or pressure. Mostly occurs on feet
(4) Treatment
  (a) Avoid aggravating area by removing cause as soon as possible (e.g., tight shoes/boots, wet socks)
  (b) "DO NOT" lance blister unless unable to remove cause (e.g., blister located on foot during a road march)
  (c) If cause can not be removed, lance bottom of blister with a sterile needle or scalpel, and allow to drain
  (d) Keep area covered and clean. Build up dressing around blister to prevent friction

Identify and Manage Fungal Infections of the Skin

Fungal infections are common on the feet and the body

(1) Fungal infections may be pruritic or asymptomatic. Occasionally there is tenderness and inflammation
(2) Symptoms- depend on the location
  (a) Scalp (tinea capitus)- alopecia, scaling, swelling and occasional purulent discharge
  (b) Feet (tinea pedis)- scaling, thickened soles, occasional blisters
  (c) Skin (tinea corporis)- inflammation and scaling
(3) Skin (Tinea Corporis)
  (a) Erythematous plaque with central clearing and sharp margins
  (b) The organism may persist indefinitely, causing intermittent remissions and exacerbations of a gradually extending lesion with a scaling, slightly raised border
  (c) Intense inflammation with or without pustules may be present
  (d) Treatment- Most skin infections respond very well to topical antifungal preparations, such micatin, tinactin or lamisil. Resistant cases or those with widespread involvement require systemic antifungal therapy.
(4) Tinea pedis (Athlete's Foot)

(a) Infections typically begin in the 3rd and 4th interdigital spaces and later involve the plantar surface of the arch
(b) Toe web lesions often are macerated and have scaling borders; they may be vesicular
(c) Acute flare-ups, with many vesicles and bullae, are common during warm weather
(d) Tinea pedis may be complicated by secondary bacterial infection, cellulitis, or lymphangitis, which may recur
(e) Treatment- Interdigital infections can be successfully treated with topical agents. Good foot hygiene is essential. Interdigital spaces must be dried after bathing, macerated skin gently debrided, and a bland, drying antifungal powder (eg, miconazole) applied
(f) Cure with topical treatment is difficult, but control may be obtained with long-term therapy. Recurrence is common after therapy is discontinued

(5) Tinea capitis (Scalp): Tinea capitis mainly affects children. It is contagious and may become epidemic
(a) Inflammation that is low-grade and persistent. Alopecia may occur with characteristic black dots on the scalp result from broken hairs
(b) Treatment- topical treatment is not advised. Oral antifungal therapy is indicated

(6) Tinea cruris (Jock Itch)
(a) Typically, a ringed lesion extends from the crural fold over the adjacent upper inner thigh. Both sides may be affected
(b) Scratch dermatitis and lichenification often occur. Lesions may be complicated by maceration, miliaria, secondary bacterial or candidal infection, and reactions to treatment
(c) Recurrence is common because fungi may repeatedly infect susceptible persons. Flare-ups occur more often during summer, due to heat and humidity of the skin area
(d) Tight clothing or obesity tends to favor growth of the organisms
(e) Treatment- Topical therapy with a cream or lotion, as in tinea corporis, is often effective. Instruct the patient to keep the area as clean and dry as possible,

Identify and Manage Other Skin Disorders

Scabies

The arthropod itch mite causes the dermatitis scabies in humans. Transmission occurs between people via skin-to-skin contact or through bed linens and clothing

(1) Signs and Symptoms
(a) Intense itching, especially at night, with vesicles, papules and linear burrows which contain the mites and eggs
(b) Lesions prominent around finger webs, elbows, buttocks and genital area

(c) Complications are generally due to infection of lesions that are broken from scratching

(2) Treatment
- (a) Treatment should include the patient, sexual partners, household members and caregivers
- (b) Overnight applications of topical medications have proven to be the most effective
- (c) Bag patient's linen separately. Instruct the patient to wash bedding in HOT water

Lice

(1) Three types:
- (a) Pediculosis Pubis
  - (i) Infestation in the pubic region
  - (ii) Spread by intimate contact, often sexual
  - (iii) The lice survive for about one day off the host.
- (b) Pediculosis capitis
  - (i) Infestation on the scalp
  - (ii) Spread by casual contact and by fomites such as shared combs or hats
  - (iii) Survive only a few days off the host.
- (c) Pediculosis corporis
  - (i) Usually found on clothing, particularly in the seams around warm areas
  - (ii) Come onto the skin only to feed

(2) Signs and Symptoms
- (a) Pediculosis Pubis
  - (i) Complains of perineal pruritus
  - (ii) Examination shows adult lice attached to the skin and nits attached to hair shafts
  - (iii) Blue macules around the thighs and pubic area may occur at sites where the organism is feeding
- (b) Pediculosis capitis
  - (i) Complains of itching of the scalp or eyelashes
  - (ii) Examination shows adult lice in hair
  - (iii) Nits at the base of the hair shaft, macules, wheals, and excoriations are present
- (c) Pediculosis corporis
  - (i) Complains of diffuse pruritus (especially if there is evidence of generally poor hygiene)
  - (ii) Examination reveals erythematous macules, wheals, and excoriations, often with superinfection
  - (iii) Lice are found in clothing rather than on body

(3) Treatment of Pediculosis pubis, capitis, corporis
- (a) Overnight applications of topical medications have proven to be the most effective
- (b) Bag patient's linen separately. Instruct the patient to wash bedding in HOT water

(c) Hats, combs, and brushes should be thoroughly cleaned before being reused

(d) Sexual contacts of patients should be also be treated and close contact of patient with pediculosis capitis and corporis should be examined for lice.

(e) Since both scabies and pediculosis may be sexually transmitted, examination for other sexually transmitted diseases should be performed and a serologic test for syphilis (VDRL or other) obtain

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked M5 Bag or Combat Medic Vest System, oxygen, suction and ventilation equipment (if available), selected medications, and documentation forms. You encounter a casualty complaining of infectious disease and/or immunological symptoms. No other injury(ies) are present.

Review Concepts Associated with Infectious Diseases

Public health principles relative to infectious diseases

(1) All humans are susceptible to infectious disease
(2) Individuals display varying susceptibilities to infection
(3) When dealing with infectious diseases, the soldier medic must consider the needs of the casualty, potential consequence on public health and his own health protection
(4) The soldier medic should think of the consequences of the patients' contact with family members, roommates and friends

Infectious agents

(1) Bacteria- unicellular microorganisms
(2) Viruses- submicroscopic organism. Able to replicate only in a living cell
(3) Fungi- spore bearing plants
(4) Rickettsia- microorganisms, which combine qualities of bacteria and viruses
(5) Helminths (worms)- various invertebrates, having round or flattened bodies

Terminology of the immune system

(1) Antibodies- a protein produced by lymphocytes in response to infectious agents
(2) Antigen- A substance which causes the formation of an ant body
(3) Epitope- a specific site where an ant body binds. May be numerous epitopes on one antigen
(4) Leukocytes- White blood cells
    (a) Five types:
        (i) Lymphocytes
            * T cells - Divide rapidly when exposed to antigen. May assist in destroying foreign protein
            * B cells - circulate in immature form, activated when exposed to antigen
        (ii) Monocytes
            * Ingest dead or damaged cells via phagocytosis (absorption of foreign bodies in the bloodstream)
            * Provide immunological defenses against infectious organisms
        (iii) Neutrophils

* Essential for phagocytosis

(iv) Basophils
* Increased number during healing phase and inflammation
* Immediate immune response to external antigens

(v) Eosinophils
* Increase numbers in certain diseases, especially infections by helminths and allergies

Host defense mechanisms

(1) Nonspecific immune system defenses
(a) Skin
(i) Effectively bars invading microorganisms
(ii) Some exceptions occur, as with human papillomavirus (causative agent of warts) which can invade normal skin
(iii) Normal dermal flora - alteration of this flora can lead to overgrowth of inherently pathogenic microorganisms
(b) Respiratory system
(i) Inhaled microorganisms must penetrate the filter system of the upper airways and tracheobroncial tree
(ii) Coughing also helps remove organisms
(iii) Smoking greatly impairs effectiveness
(iv) These defense mechanisms can be overcome by large numbers of organisms or by compromised effectiveness resulting from air pollutants
(c) Inflammatory response
(i) Directs immune system components to injury or infection sites and is manifested by increased blood supply and vascular permeability
(ii) Microorganisms are engulfed by phagocytic cells in an attempt to contain the infection
(2) Specific immune system defenses
(a) Humoral immunity
(i) Component of the immune system involving antibodies
(ii) Recognizes antigens associated with microorganisms or foreign substances
(iii) Recognition is coupled with ability to initiate appropriate actions against these microorganisms or foreign substances
(b) Cell-mediated immunity
(i) Phagocytic and/or cytotoxic cells play major role
(ii) Antibody plays minor role

(iii) Macrophages and neutrophils important in combating bacteria
(iv) T cells essential to elimination of virus-infected cells

General Assessment of Suspected Infectious or Communicable Disease

Primary assessment

(1) Ensure open airway
(2) Assess breathing
(3) Assess circulation

Secondary assessment (specific to infectious disease)

(1) History of present illness
(2) Past medical history
  (a) Chronic infections, inflammation
  (b) Medications
  (c) Medical and surgical history
(3) Detailed history and physical
  (a) Vital signs
  (b) Assess skin
    (i) Temperature
    (ii) Turgor (hydration)
    (iii) Color (jaundice)
    (iv) Abnormal lesions
  (c) Assess Head, Ears, Eyes, Neck, and Throat (HEENT)
  (d) Assess neck
    (i) Lymphadenopathy - localized or generalized enlargement of lymph nodes or lymph vessels
    (ii) Rigidity
  (e) Assess for abnormal breath sounds
  (f) Assess abdomen
    (i) Tenderness
    (ii) Rebound
    (iii) Guarding or organomegaly
  (g) Assess extremities for edema, pain and joint range of motion (ROM)

Assess and Treat Eye, Ear, Nose, Throat, and Respiratory Complaints

Conjunctivitis (pink eye)

(1) Infection of the membrane lining the eyelids (conjunctiva)
(2) Signs and Symptoms- may be unilateral or bilateral
  (a) Pruritus
  (b) Burning
  (c) Itching
  (d) Swelling
  (e) Excessive purulent discharge or tearing
  (f) Redness

(3) Provide medical care
- (a) Perform visual acuity before any treatment is initiated
- (b) Ensure eye is not injured and no foreign body is present
- (c) Administer ophthalmic ointments or solutions for conjunctivitis as ordered by MD/PA
- (d) Use universal precautions gloves), conjunctivitis is very contagious

Pharyngitis (sore throat)

(1) The majority of sore throat complaints are viral in origin, not bacterial
(2) Most common bacteria causing pharyngitis is group A Beta hemolytic streptococcus
(3) Signs and symptoms
- (a) Often difficult to clinically differentiate between viral and bacterial infections
- (b) Patients with a bacterial (strep) infection may present with:
  - (i) Sudden on set of sore throat
  - (ii) Painful swallowing
  - (iii) Chills and fever
  - (iv) Headache, nausea, vomiting and abdominal pain are common associated symptoms
- (c) Physical examination of patients with strep throat reveals
  - (i) Foul smelling breath
  - (ii) Beefy red throat
  - (iii) Tonsillar exudate
  - (iv) Enlarged, tender anterior cervical lymph nodes. There is no posterior cervical adenopathy.
  - (v) Patient may have petechiae on the palate and strawberry tongue
- (d) Patient with a viral pharyngitis usually present with a more vesicular and petechial pattern on the soft palate and tonsils and no exudate
- (e) Throat culture remains the most effective method for diagnosis

(4) Provide medical care
- (a) Symptomatic treatment
  - (i) Gargling with warm salt water
  - (ii) Drinking warm liquids
  - (iii) Rest
  - (iv) Consider IV hydration in patients who are unable to tolerate oral fluids or who become dehydrated
- (b) Antibiotics
  - (i) Drug of choice for strep throat is penicillin. Ampicillin or amoxicillin may also be used.
  - (ii) May also consider cephalosporin
  - (iii) Erythromycin is drug of choice for patients allergic to penicillin
  - (iv) Oral medications usually administered for 10 days even though pain from sore throat may resolve in 24-48 hours

(v) Refer to MD/PA for appropriate therapy

(c) Untreated strep throat (group A B – hemolytic streptococcus) is associated with significant sequela in the form of acute rheumatic fever or acute glomerulonephritis. Because of this, early diagnosis and treatment of strep throat is essential.

(d) Prevent spread
- (i) Handwash
- (ii) Avoid using same utensils or drinking from same container
- (iii) Avoid close contact

(e) Infectious mononucleosis
- (i) Acute viral infection is primarily caused by an Epstein-Barr virus (EBV). Infrequent causes are Cytomegalovirus (CMV) and Human Immunodeficiency Virus (HIV)
- (ii) Humans are the sole source, with transmission by close contact. Incubation period is 3-7 weeks.
- (iii) Assessment findings
  - * High fever
  - * Swollen lymph glands
  - * Sore throat
  - * Fatigue
  - * Persistent headache
  - * Acute phase lasts 1-3 weeks, with complete recovery expected in 6-8 weeks
  - * Most serious complication is splenic rupture due to an enlarged spleen, combined with physical activity. Limited activity during the acute phase is required. All soldiers must be assessed by an MD/PA for suspected mono cases.
- (iv) Provide care
  - * Uncomplicated acute infectious mononucleosis usually only requires supportive therapy
  - * Consider Tylenol for fever and pain
  - * Warm salt water gargles for sore throat
  - * Patient should get ample bed rest. Isolation is unnecessary because EBV shedding continues after the acute illness
  - * Recovery occurs in a few weeks; however, some people take months to regain former level of energy

Influenza

(1) Viral infection of the respiratory tract
(2) Flu vaccine is available annually. Influenza is self-limited in healthy individuals, but its potentially severe consequences must be stressed to elderly or chronically ill patients to ensure their annual vaccination.
(3) Assessment findings
  (a) Fever- may be high (up to 103 degrees)- rapid onset and may last 3-5 days
  (b) Cough- usually nonproductive. If a secondary bacterial infection occurs, cough turns productive with purulent sputum
  (c) Headache
  (d) Muscle aches- may to tender to palpation
  (e) Shortness of breath
  (f) Chills
  (g) Sweating
  (h) Fatigue
  (i) Nausea and vomiting
  (j) Joint stiffness and aches
  (k) Nausea, vomiting
(4) Provide medical care
  (a) Because influenza is a viral infection, antibiotics are not helpful
  (b) Bed rest
  (c) Provide analgesics for muscles aches
  (d) Provide oral or intravenous fluids
  (e) Symptoms may last 7 - 10 days
  (f) Notify MD/PA if:
    (i) Symptoms increase
    (ii) Fever is present
    (iii) Unable to keep food or fluids down

Cough

(1) Sudden, forceful release of air from the lungs
  (a) Helps clear material
  (b) May produce and expel mucus and/or pus - productive cough
  (c) Minor irritations in throat can start cough reflex though normal mucus is only material expelled - dry cough
(2) Common causes include:
  (a) Smoking
  (b) Common cold or flu
  (c) Allergies
  (d) Bacterial infection
  (e) Viral infection
  (f) Asthma
  (g) Emphysema
(3) Assessment Findings
  (a) Shortness of breath requires immediate evaluation.

(b) Productive or nonproductive cough - Productive may be rusty/blood-streaked, yellow-green or yellow sputum
(c) Elevated temperature
(d) Chest may be clear to auscultation or have abnormal breath sounds (wheezing, rhonchi or crackles)

(4) Provide medical care
(a) Increase air humidity, if available
(b) Inform patient to drink extra fluids
(c) Consider an expectorant to help liquefy secretions
(d) Consider a decongestant if cough is accompanied by runny nose
(e) Consider antihistamines if caused by allergy or sinus infection
(f) Dry tickling coughs can be relieved by lozenges

(5) Notify MD/PA if:
(a) Violent cough begins suddenly or high-pitched sound (stridor)
(b) Produce blood
(c) Shortness of breath and/or difficulty breathing
(d) Abnormal breath sounds are heard on auscultation
(e) Fever or abdominal swelling
(f) Unintentional weight loss
(g) Thick, foul-smelling, rusty, or greenish mucous
(h) Lasts more than 10 days

Pneumonia

(1) Inflammation of lungs caused by an infection
(2) Prevention
(a) Vaccination (flu, pneumovax) may be helpful in preventing some types of pneumonia
(b) Coughing and deep breathing

Bronchitis

(1) Inflammation of the bronchi
(2) Prevention
(a) Early recognition
(b) Treat small airway disease
(c) Smoking cessation

Viral Upper Respiratory Infection (Common Cold)

(1) Contagious viral infection of the upper respiratory tract. Transmission may occur through air droplets (sneezing) or lack of handwashing
(2) Assessment Findings (usually minimal)
(a) Runny nose
(b) Nasal congestion
(c) Sneezing
(d) Sore throat
(e) Cough
(f) Muscle aches
(g) Headache

(h) Low grade fever (100 F or lower)

(3) Provide medical care
- (a) Consider antihistamine and/or decongestant for nasal congestion
- (b) Consider Tylenol for minor aches and pains
- (c) Patient should get able bed rest
- (d) Instruct patient to drink plenty of fluids
- (e) Patient should return to MTF if:
  - (i) Develop temperature greater than 101F
  - (ii) Develop a productive cough
  - (iii) Symptoms do not begin to improve within the next 2-3 days

Assess and Treat Gastrointestinal (GI) Complaints

Nausea/Vomiting

(1) Nausea is the sensation leading to the urge to vomit

(2) Vomit is to force the contents of the stomach up through the esophagus and out of the mouth

(3) A common cause is a viral infection. Assessment findings include:
- (a) Presence of absence of abdominal pain
- (b) Description of emesis
- (c) Fever

(4) Provide care
- (a) Instruct patient to drink clear fluids for 24 hours. Solids should be increased as tolerated.
- (b) Patient should get bed rest
- (c) Instruct patient to return to MTF if:
  - (i) Blood is in vomitus
  - (ii) Increasing abdominal pain
  - (iii) Nausea/vomiting persists for greater than 24 hours

Diarrhea

(1) Frequent passage of unformed, watery stool

(2) Infectious diarrheal disease can be grouped:
- (a) Viruses
- (b) Bacteria
- (c) Parasites
- (d) Funguses

(3) Assessment findings include:
- (a) Abdominal cramps
- (b) Fever

(4) Provide care
- (a) Observe good hygiene. Wash hands frequently.
- (b) Consider Imodium (only if non bloody) or Pepto-Bismol
  - (i) May be given to the patient for the symptomatic control of diarrhea
  - (ii) Best treatment is NOT to interfere with the mechanical cleansing of the GI tract

(c) If diarrhea is not controlled in 24-48 hours with normal medications, refer patient to MD/PA for assessment

Gastroenteritis

(1) Inflammation of stomach and intestines due to bacterial or viral infection
(2) Modes of transmission
  (a) Fecal-oral
  (b) Ingestion of infected food or non-potable water
(3) Susceptibility and resistance
  (a) Travelers into endemic areas are more susceptible
  (b) Populations in disaster areas, where water supplies are contaminated, are susceptible
  (c) Native populations in endemic areas are generally resistant
(4) Assessment findings include:
  (a) Nausea/Vomiting
  (b) Diarrhea
  (c) Fever
  (d) Abdominal pain and cramping
  (e) Diarrhea
  (f) Heartburn
(5) Provide care
  (a) Antibiotic therapy is usually not indicated
  (b) Consider antidiarrheal medications, though not generally given because they may prolong infectious process
  (c) Clear liquid diet

Assess and Treat a Fever, Headache, and Sinus Symptoms

Fever-

Fever is a common presenting symptom, accounting from 2-6 percent of adults presenting to hospital emergency rooms and clinics.

(1) Fever can be due to:
  (a) Infection: all causes, whether bacterial, viral or parasitic
  (b) Trauma
  (c) Immunologic: serum sickness or acute inflammatory arthritis
  (d) Drug induced
  (e) Vascular disorders: acute myocardial infarction, pulmonary emboli
(2) Acute bacterial infection requires a timely diagnosis and treatment. The initial approach to evaluating a patient with an acute fever is detecting a treatable infection or excluding a bacterial infection with reasonable certainty.
(3) Fever above 100 F must be evaluated by an MD/PA
(4) Provide care
  (a) Administer Tylenol or Motrin. The use of aspirin should not be used due to bleeding problems

(b) If fever is uncontrolled, seek methods of cooling patient. Such as cooling mats, tepid baths or showers.

Headache

(1) Meningitis- an infection of the meninges (the membranes surrounding the brain)
- (a) Causes:
  - (i) Bacterial
  - (ii) Viral
  - (iii) Fungal
- (c) Signs and Symptoms
  - (i) Headache, sudden onset, severe, usually occipital
  - (ii) Fever
  - (iii) Chills
  - (iv) Photophobia
  - (v) Neck stiffness or nuchal rigidity (more pronounced on flexion)
  - (vi) Petechial rash - Bacterial
  - (vii) Altered mental status
  - (viii) Nausea and vomiting
- (d) Provide medical care
  - (i) Protective measures should include BSI with surgical masks applied to casualties displaying suggestive signs/ symptoms
  - (ii) **Meningitis is a medical emergency. Delay in treatment will result in death.** Notify MD/PA immediately and evacuate
  - (iii) Initiate IV
  - (iv) Perform serial neurological examinations

Sinusitis

(1) Disorder involving infection and/or inflammation of one or more of the paranasal sinuses. The maxillary sinuses are the most frequently affected. Factors predisposing to sinusitis are upper respiratory infection, smoking, allergies and nasal polyps.

(2) Assessment findings include:
- (a) Headache
- (b) Purulent nasal discharge
- (c) Cough
- (d) Pain in the sinus area with palpation or percussion
- (e) Facial pain
- (f) Pain may also be referred to the teeth. Patients may complain of a "toothache“.

(3) Provide medical care
- (a) Administer analgesics to relieve pain
- (b) Administer saline or decongestant nasal sprays to increase drainage
- (c) Consider an expectorant/mucolytic to thin secretions and promote drainage

(d) Antibiotic therapy is indicated for 10-21 days. Antibiotic choice is based on duration of symptoms and the individual patient
(e) Refer patient to MD/PA for suspected sinus infections

Assess and Treat Hepatitis

Viral Hepatitis-

Management of viral hepatitis has been through major changes, therefore knowledge of the various types is important. At least 7 major viruses have been identified and cause the majority of disease

(1) **Hepatitis A**- inflammation of liver caused by hepatitis A virus
  (a) Seen worldwide and is a food and water-borne disease
  (b) Spread by fecal-oral contact
(2) Signs and symptoms
  (a) Symptoms are similar to flu
    (i) Fever
    (ii) Weakness
  (b) Jaundice of skin and eyes - liver is not able to filter bilirubin from blood
  (c) Darkening of urine
  (d) Clay colored stools
  (e) Nausea and vomiting
(3) Provide care
  (a) Treatment is primarily supportive
  (b) Rest should be recommended during acute phases
  (c) Patient should avoid alcohol and substances toxic to liver
  (d) Full recovery usually within 1 month
  (e) Patient education should be given advising avoidance of unbottled drinking water, ice, shellfish or unpeeled fruits and vegetables in endemic areas
  (f) Hepatitis A vaccine is available prior to deployment to endemic areas
(4) **Hepatitis B and Hepatitis C**- inflammation of the liver caused by a Hepatitis B virus or Hepatitis C virus
  (a) Transmission is parenteral, with the virus found in body fluids such as blood, semen and saliva
  (b) Sexual transmission is common
  (c) IV drug usage is also and important mode for transmission
(5) Assessment findings
  (a) Jaundice
  (b) Fatigue
  (c) Nausea and vomiting
  (d) Low grade fever
  (e) Pale or clay color
  (f) Abnormal urine color/dark urine
  (g) Abdominal pain and enlarged liver
  (h) In Hepatitis C, many patients are asymptomatic
(6) Provide care

(a) Treatment is primarily supportive. Interferon is used with some success in Hepatitis B and C patients.
(b) Bedrest and occasionally hospitalization during the acute phase is necessary
(c) Patient should avoid alcohol and substances toxic to liver
(d) Patient should be informed of preventative measures
(i) Hepatitis B vaccination series
(ii) Condoms if sexually active
(iii) Test for HIV

(7) **Hepatitis D**
(a) Hepatitis D occurs only in association with Hepatitis B infection. Mode of transmission is similar to Hepatitis B
(b) May increase severity of disease associated with Hepatitis B
(c) Treatment is same as for hepatitis B

(8) **Hepatitis E**
(a) Hepatitis E is a food and water-borne disease
(b) Associated with epidemics where there is fecally contaminated water
(c) Treatment and travel precautions are identical to Hepatitis A

(9) **Hepatitis G-** has recently been identified is patients with Hepatitis that was not Hepatitis C
(a) Liver disease has not been proven
(b) Signs and symptoms have not yet been characterized

Assess for Human Immunodeficiency Virus (HIV)

A viral infection-

Caused by the human immunodeficiency virus (HIV) that gradually destroys the immune system. Although the virus has been found in all body fluids, only blood, semen and vaginal secretions have been implicated in transmission. There are three known routes of transmission:

(1) Sexual transmission (anal, oral or vaginal)
(2) Blood or blood products (transfusions, infected needles)
(3) Perinatal transmission (in utero, at delivery or through breastfeeding)

History of HIV

(1) Initial case definition was established by CDC in 1982
(2) In 1987 and 1993, case definitions were expanded to include additional illnesses

Body systems affected and potential secondary complications - generally related to opportunistic infections that arise as immune system compromise develops

(1) Nervous system - toxoplasmosis of CNS
(2) Immune system - major site of compromise
(3) Respiratory system - pneumocystis carinii pneumonia
(4) Integumentary system - Kaposi's sarcoma

Health care workers -

(1) At risk increased when:
- (a) The exposure involves a large quantity of blood
- (b) Needle or instrument stick needle size, type (hollow bore versus suture), and depth of penetration
- (c) The exposure to a patient with a terminal HIV related illness, possibly reflecting a higher viral load in the late course of AIDS
- (d) Universal precautions not adhered to

(2) Risk needs to be understood in terms of how the exposure occurred, and what factors were involved

(3) Potential may appear to be high, but the probability may actually be quite low

Assessment findings- Asymptomatic HIV Infection

(1) Asymptomatic HIV patients must have had no previous signs or symptoms attributable to HIV infection

(2) History may be suggestive of an acute mononucleosis or flulike syndrome in the past

(3) Physical examination of asymptomatic HIV patient is completely normal

(4) Diagnosis is made with laboratory evidence only

Assessment Findings-

Early Symptomatic HIV Infection

(1) With disease progression, CD4 lymphocyte counts decrease. There is an increased risk of opportunistic infections

(2) Signs and symptoms associated with early HIV disease are frequently nonspecific
- (a) Fever
- (b) Sore throat
- (c) Fatigue
- (d) Myalgia
- (e) Weight loss
- (f) Night sweats
- (g) Lymphadenopathy
- (h) Chronic cough
- (i) Shortness of breath
- (j) Oral lesions, ulcers
- (k) Chronic diarrhea
- (l) Skin rashes

(3) Diagnosis is made with laboratory evidence and presence of one or more opportunistic infections:
- (a) Oral candidiasis
- (b) Generalized wasting
- (c) Generalized lymphadenopathy
- (d) Hepatosplenomegaly
- (e) Severe herpes zoster in a previously healthy person
- (f) Pneumocystis carinii pneumonia

Assessment Findings-

Late Symptomatic HIV Infection

(1) Progressive destruction of CD4 cells by the HIV virus places the patient at risk for opportunistic infections, routine infections and malignancies
(2) Symptoms depend on reactivation of previous illness or exposure to new infections. Commonly seen are:
  (a) Chronic headaches
  (b) Seizures
  (c) Chronic diarrhea
  (d) Weight loss leading to wasting
  (e) Chronic fever
  (f) Visual changes leading to blindness

Provide care

(1) Treatment of HIV is complex and beyond the scope of the handout
(2) Isolation is unnecessary, ineffective and unjustified
(3) Observe BSI when treating an HIV patient
(4) Psychosocial evaluation of the patient is indicated because of the high incidence of family dysfunction, depression and suicide associated with HIV infection
(5) Sexual partner notification by Preventive Medicine is essential to prevent transmission
(6) Consistent use of latex condoms, preferably with nonoxynol-9, a spermicide is recommended to prevent sexual transmission of HIV. Petroleum based lubricants should be avoided because they increase the risk of condom rupture

Assess and Treat for Lyme Disease

An acute inflammatory disease-

Caused by the spirochete Borrelia burgdorferi Transmitted by the bite of a deer tick.

Assessment findings-

(1) An early localized stage with a painless skin lesion at the site of the bite, called erythema migrans (EM), and a flu-like syndrome with malaise, myalgia
(2) EM starts off as a red, flat, round rash which spreads out; the outer border remains bright red, with the center becoming clear, blue, or even necrose and turn black
(3) Incubation period until EM - 3 to 32 days post tick exposure
(4) Fever and headache
(5) Inflammation in the knees and other large joints in systemic infection

Patient management and control measures

(1) The 91W Medic who works, or treats/ transports casualties in a wilderness environment, should be vigilant to the presence of ticks on themselves and their casualties
(2) There is no evidence of natural transmission from person-to-person
(3) Tetracycline is the drug of choice given 500mg four times a day for 10-30 days

(4) Consider anti-inflammatory medications to relieve joint stiffness

Identify Viral Diseases of Childhood

Chickenpox

(1) A highly contagious, usually mild childhood disease caused by the Herpes varicella-zoster virus.
(2) Assessment findings
  (a) Begins with:
    (i) Mild respiratory symptoms
    (ii) Malaise
    (iii) Low-grade fever
  (b) Rash begins as small red spots that become raised blisters on a red base. These fluid-filled vesicles eventually collapse and dry into scabs
  (c) Intense itching
(3) Provide care
  (a) Do NOT give aspirin due to association with Varicella and Reye's syndrome.
  (b) Isolation of patient from medical offices, emergency departments, and public places until all lesions are crusted and dry
  (c) Consider antiviral drugs exist that shortens the duration of symptoms and pain in the older patient
  (d) Soldier medics who have not had chickenpox should inquire with their chain of command about receiving the chickenpox vaccine
  (e) VZIG (Varicella Zoster immune globulin) is recommended for pregnant women with a substantial exposure (household contact, close indoor contact > 1 hour, or prolonged direct face-to-face contact with infected person) to chickenpox with no history of previous exposure to chickenpox

Mumps

(1) An acute, contagious viral disease that causes painful enlargement of the salivary or parotid glands
(2) Assessment findings
  (a) Fever
  (b) Swelling
  (c) Tenderness of salivary glands, especially parotid
  (d) Sore throat
(3) Provide care
  (a) There is no specific treatment for mumps. Measles, Mumps, Rubella (MMR) immunization should be considered.
  (b) Symptoms may be relieved by:
    (i) Ice or heat to affected neck area
    (ii) Acetaminophen for pain relief
    (iii) Warm salt water gargles

(iv) Soft foods
(v) Extra fluids

Rubella (German Measles)

(1) A contagious viral infection with mild symptoms associated with a rash
(2) Assessment findings
  (a) A rash that spreads from forehead to face to torso to extremities, and lasts 3 days,
  (b) Serious complications, such as encephalitis, which may occur in measles, do not occur in Rubella
  (c) Younger females sometimes develop a self-limiting arthritis
  (d) Cloudy cornea
  (e) Low grade fever
  (f) Inflammation of the eyes
(3) Provide medical care
  (a) Consider MMR immunization
  (b) There is no treatment- supportive care primarily
  (c) Acetaminophen can be given to reduce fever

Measles (rubeola, red measles)

(1) Highly contagious viral illness
(2) Assessment findings
  (a) Conjunctivitis
  (b) Swelling of the eyelids
  (c) Photophobia
  (d) High fevers to 105 degrees
  (e) Hacking cough
  (f) Malaise
  (g) Rash
(3) Provide care
  (a) Immunization
    (i) Effective immunization should be instituted for every person, and is available for combination with other vaccines and/ or toxoids (MMR)
    (ii) Immunization in children is believed to confer 99% immunogenicity
  (b) There is no specific treatment. Symptomatic care:
    (i) Bed rest
    (ii) Acetaminophen
    (iii) Humidified air

Pertussis (Whooping cough)

(1) A highly contagious bacterial disease that affects the respiratory system and produces spasms of coughing that usually end in a high-pitched crowing inspiration (whooping sound)
(2) Assessment findings

(a) Cough
(b) Crowing or high-pitched inspiratory whoop
(c) Expulsion of clear mucous
(d) Vomiting

(3) Provide care
(a) Erythromycin is given 500mg four times a day for 10 days
(b) Consider oxygen with high humidity
(c) Intravenous fluids may be indicated if coughing is severe enough to prevent adequate oral fluid intake

Reporting an Exposure to an Infectious/ Communicable Disease

What constitutes an exposure?

The following should be considered an exposure incident:
(1) Eye
(2) Mouth
(3) Other mucous membranes
(4) Non-intact skin
(5) Parenteral contact with blood
(6) Blood products
(7) Other potentially infectious materials

Why it is important to report?

(1) Permits immediate medical follow up, permitting identification of infection and immediate intervention
(2) Enables the Designated Officer (DO) to evaluate the circumstances surrounding the incident and implement engineering or procedural changes to avoid a future exposure
(3) Facilitates follow up testing of the source individual if permission for testing can be obtained
(a) Under provisions of the Ryan White Act, the exposed employee has the right to request the infection status of the source casualty from the casualty's health care provider, but neither the agency nor the employee can force testing of the source individual
(b) Employers must, and should as part of an effective Exposure Control Plan, tell the employee what to do if an exposure incident occurs

Preventing disease transmission

(1) Notify supervisor for proper disposition
(a) If you have diarrhea
(b) If you have a draining wound or any type of wet lesions; wait until lesions are crusted and dry
(c) If you are jaundiced
(d) If you have been told you have mononucleosis/hepatitis
(e) If you have not been treated with a medication and/ or shampoo for lice and scabies
(f) Until you have been taking antibiotics for at least 24 hours for a step throat

(g) Observe BSI
(i) Always wear gloves
(ii) If chance of splash, wear protective eyewear or face shield
(iii) If large volumes of blood are possibility, wear a gown
(iv) When contacting a possible TB casualty, wear appropriate particulate mask

(h) Patients with coughs, headaches, general weakness, recent weight loss, stiff necks, high fevers, and taking medications suggestive of an infectious process are tip-offs in history taking, with experience, the list will get longer for you

(i) If after a call with lice, scabies, ticks or other insect vectors
(i) Spray the stretcher and casualty compartment with an insecticide, then wipe off/ mop up insecticide residue
(ii) Bag the linen separately, and ensure that it not be taken home; bottom line is that it needs to be washed separately
(iii) Report any infectious exposure to the designated officer/ manager of your agency identified as such

(2) Effective hand washing, to include the webs of the hands

(3) The major infectious diseases that 91W Medic personnel should have in-depth knowledge of for purposes of regulatory compliance
(a) HIV
(b) Hepatitis
(c) Tuberculosis
(d) Sexually transmitted diseases

(4) Understand the concept of occupational risk
(1) Appreciate that infectious agent mode of entry, virulence, dose, and host resistance factors combine to define risk, or potential for infection
(2) Just because there is risk, doesn't mean that you will become infected
(3) Not all infectious diseases are communicable and do not always pose risks to family members
(4) Risk and potential does not necessarily equate to probability; HIV is a good example - risks for infection may appear to be high, but the probability of occupational exposure is very low (0.2-0.44%)

Medical and legal aspects of reporting and recording an exposure

(1) Out-of-hospital personnel deal with very few infectious disease emergencies, but must be vigilant about consequences to themselves, as well as their casualties and coworkers, based on daily, often unknown exposures to infectious agents

(2) Universal/ standard precautions for soldier medics are superseded by body substance isolation guidelines, based upon the premise that all body fluids, in any situation, may be infectious

(3) Contact Preventive Medicine for any questions concerning infectious diseases and reporting protocols

Appendix A
Insert and Remove NG Tube
Competency Skill Sheets

NG Tube Insertion

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Checked doctors orders.	P / F	P / F	P / F
b.	Washed hands. Removed rings and watch.	P / F	P / F	P / F
c.	Gathered and assembled equipment.	P / F	P / F	P / F
d.	Identified patient and explained procedure.	P / F	P / F	P / F
e.	Prepared and positioned patient. (1) Removed dentures, if used. (2) Washed hands. (3) Hyperextended neck. (4) Protected patient with protective pad or towel. (5) Donned gloves.	P / F	P / F	P / F
f.	Measured the tube for insertion distance (Tip of nose-proximal earlobe-tip of sternum). Marked with tape.	P / F	P / F	P / F
g.	Inspected nasal.	P / F	P / F	P / F
h.	Lubricated the tip of NG tube with water soluble lubricant.	P / F	P / F	P / F
i.	Inserted NG tube. (1) Inserted tube into nostril while pointing tip backward and downward. (2) Stopped when first mark on tube is at tip of the nose. (3) Used flashlight to inspect back of throat. (4) Instructed patient to lower chin to chest and swallow sips of water through straw. (5) Advanced tube 3 to 5 inches each time patient swallows. (6) Continued advancing until reach second tape mark.	P / F	P / F	P / F
j.	Checked tube placement.	P / F	P / F	P / F
k.	Anchored tube.	P / F	P / F	P / F
l.	Clamped or connected tube to suction.	P / F	P / F	P / F
m.	Positioned patient with a minimum head elevation of 30 degrees, to prevent gastric reflux.	P / F	P / F	P / F
n.	Removed gloves and washed hands.	P / F	P / F	P / F
o.	Recorded procedure.	P / F	P / F	P / F

Instructor Comments:

NG Removal

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Identified patient and explained procedure.	P / F	P / F	P / F
b.	Washed hands and donned gloves.	P / F	P / F	P / F
c.	Untapped tube.	P / F	P / F	P / F
d.	Enclosed tube within the towel or glove. Discarded appropriately.	P / F	P / F	P / F
e.	Removed gloves and washed hands.	P / F	P / F	P / F
f.	Instructed patient on mouth care (or provide if necessary).	P / F	P / F	P / F
g.	Encouraged patient to clear nose of mucus and debris.	P / F	P / F	P / F
h.	Documented.	P / F	P / F	P / F

Instructor Comments:

Appendix B
Insert and Remove Foley Catheter
Competency Skill Sheets

Insert Foley Catheter

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Checked doctor's orders.	P / F	P / F	P / F
b.	Washed hands.	P / F	P / F	P / F
c.	Gathered and assembled equipment.	P / F	P / F	P / F
d.	Identified patient and explained procedure.	P / F	P / F	P / F
e.	Positioned and draped patient.	P / F	P / F	P / F
f.	Opened catheter tray.	P / F	P / F	P / F
g.	Donned sterile gloves.	P / F	P / F	P / F
h.	Positioned moisture-proof pad under patient buttocks (female) (1) Placed moisture-proof pad across upper thighs with fenestrate pad over genitalia (males) (2) Placed fenestrated pad with opening exposing genitalia for females.	P / F	P / F	P / F
i.	Set up sterile field. Prepared equipment and tested balloon.	P / F	P / F	P / F
j.	Cleaned genitalia.	P / F	P / F	P / F
k.	Lubricated catheter.	P / F	P / F	P / F
l.	Inserted catheter until urine flow is observed. Inserted an additional one inch.	P / F	P / F	P / F
m.	Inflated balloon and repositioned catheter.	P / F	P / F	P / F
n.	Hung drainage bag from bed frame.	P / F	P / F	P / F
o.	Removed tray and secured catheter. (1) Taped to thigh of female patient. (2) Taped to abdomen of male patient.	P / F	P / F	P / F
p.	Removed and disposed of gloves. Washed hands.	P / F	P / F	P / F
q.	Recorded procedure.	P / F	P / F	P / F

Instructor Comments:

Remove Foley Catheter

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____

Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Checked doctor's orders.	P / F	P / F	P / F
b.	Washed hands.	P / F	P / F	P / F
c.	Identified patient and explained procedure.	P / F	P / F	P / F
d.	Positioned and draped patient.	P / F	P / F	P / F
e.	Untaped catheter.	P / F	P / F	P / F
f.	Deflated balloon.	P / F	P / F	P / F
h.	Removed catheter.	P / F	P / F	P / F
i.	Removed equipment and drainage system.	P / F	P / F	P / F
j.	Recorded procedure.	P / F	P / F	P / F

Instructor Comments:

91W10
Advanced Individual Training Course

Clinical Handbook
Supportive Care 2

Department of the Army
Academy of Health Sciences
Fort Sam Houston, Texas 78234

Manage a Seizing Casualty……..……..1-8
- Determine type of seizure
- Assess the casualty and overview of differential diagnosis
- Provide emergency medical care
- Provide on-going management

Assist in Vaginal Delivery……..……9-20
- Stages of Labor
- Care for Normal Delivery Outside the Hospital
- Monitor for complications during labor
- Predelivery Emergencies
- Identify additional gynecological emergencies

Perform Medical Screening……..……21-28
- Screen medical records for accuracy and completeness
- Screen immunization records for accuracy and completeness
- Screen for personnel / administrative matters
- Screen Dental Records
- Ask and record the following Medical History information on the prescribed form
- Perform a patient examination
- Disposition Plan

Immunization and Chemoprophylaxis……..……29-36
- Personnel subject to immunizations and required shots
- Chemoprophylactic Requirements
- Pre-administration Screening
- Vaccine Handling, Administrative, and Patient Care Procedures
- Reactions and possible side effects
- Documentation

Specimen Collection……..……37-40
- General principles for throat culture and sputum collection
- Stool specimens
- Urine specimens
- Blood specimens

Blood Draw……..……41-45
- General Considerations
- Steps and Procedures to Perform a Venipuncture

Appendix A – Specimen Collection, Competency Skill Sheets

Appendix B – Blood Culture, Competency Skill Sheets

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked M5 Bag or Combat Medic Vest System, given a casualty displaying seizure activity. No other injuries are identified. IAW *Emergency Care in the Streets*, *Prehospital Emergency Care*, *Trauma AIMS*

Types of seizure

Identify cause of seizure

(1) Failure to take prescribed anti seizure medication; most common cause of seizures in adults
(2) Trauma - may occur following head injury (Has the casualty fallen? Has casualty been hit in the head?)
(3) Congenital brain defect - most often seen in infants and children
(4) Infection - causes swelling or inflammation of the brain (meningitis or encephalitis)
(5) Fever - seen in children 6 months to 3 years of age usually with temperatures above 103 degrees; rarely in older children or adults
(6) Metabolic disorders - irregularities in body chemistry (diabetes/hypoglycemia)
(7) Drug toxicity - drug/alcohol use or abuse or withdrawal
(8) Brain tumor - may manifest as a seizure
(9) Previous trauma - scars on the brain from previous injuries
(10) Idiopathic - An idiopathic seizure is spontaneous. The cause of the seizure is unknown. It often starts in childhood.
(11) Hypoxia - lack of oxygen to the brain
(12) Hypertension - blood pressure is too high; seizures may be associated with cardiovascular accident (CVA)

Signs and symptoms

(1) Generalized seizures
  (a) Tonic-clonic seizure (grand mal seizure)
  "Tonic" is muscle tension (stiffness or rigidity).
  "Clonic" is the alternating contraction and relaxation of muscles in rapid succession.

    (i) May or may not be preceded by an aura
    (ii) Loss of consciousness occurs
    (iii) Characterized by tonic/clonic seizure activity throughout the entire body
    (iv) Lasts several minutes (1 to 3)
    (v) Following by a postictal phase (the patient is confused, drowsy, or unconscious)
    (vi) Type of seizure that most people associate with epilepsy and other seizure disorders
  (b) Absence seizure (petit mal seizure)
    (i) Demonstrates temporary loss of awareness to environment
    (ii) May appear to be daydreaming or staring into space
    (iii) Eyelids may flutter rapidly

(iv) The person may become unresponsive for a few seconds, then, immediately resume the task he was doing prior to the seizure. The Individual is completely unaware that anything unusual has happened.
(v) No tonic or clonic activity

(2) Partial seizures
(a) Simple partial seizure (also called Jacksonian seizure)
(i) Characterized by tonic and/or clonic movements in only one part of the body
(ii) No loss of consciousness
(iii) May progress to a generalized seizure
(b) Complex partial seizure (also called psychomotor or temporal lobe seizure)
(i) Usually preceded by an aura
(ii) No loss of consciousness
(iii) May be characterized by confusion, glassy stare, aimless movement, fidgeting, lip smacking, and chewing. The person may appear drunk or on drugs.
(iv) May progress to a generalized seizure

(3) Status epilepticus
(a) Two or more seizures without a period of consciousness between each seizure or a seizure lasting longer than 30 minutes
(i) Permanent CNS injury is more likely to occur the longer seizures are allowed to progress
(ii) Initiate treatment if continuous seizure activity lasting more than 10 minutes
(iii) The longer the seizure is allowed to continue the more difficult it will be to control
(iv) Tonic/chonic activity present; may cause long bone and spinal fractures
(v) Convulsive activity may gradually lessen over time – giving impression that seizures have been controlled
(vi) Correct diagnosis requires a high index of suspicion, a perceptive physician and sometimes an EEG
(b) Patient does not have time to breathe well or time to recover between seizures (hypoxia)
(c) True medical emergency - receives highest priority for triage and transport in mass casualty situations

Assess the casualty and overview of differential diagnosis

Report a detailed history of the seizure activity

(1) Physical description
(a) Gradual or abrupt onset

(b) Progression of motor activity
(c) Loss of bowel or bladder control
(d) Activity local or generalized
(e) Duration of the attack
(f) Ask patient if they have any recollection of the attack

(2) Clinical context of the seizure activity
  (a) Patient known epileptic
    (i) Missed doses of antiepileptic or recent alterations in medication
    (ii) Sleep deprivation
    (iii) Alcohol withdrawal
    (iv) Infection
    (v) Use of other drugs
  (b) No previous history of seizures
    (i) Symptoms that might suggest previous unwitnessed or unrecognized seizures
      * Blank or staring spells in school
      * Involuntary movements
      * Unexplained injures
      * Nocturnal tongue biting
      * Enuresis
    (ii) History of recent or remote head injury
    (iii) Persistent, severe, or sudden headache
    (iv) Concurrent pregnancy or recent delivery – possible eclampsia
    (v) History of metabolic derangement or electrolyte abnormalities, hypoxia, systemic illness (especially cancer), coagulopathy or anticoagulation, drug ingestion or withdrawal and alcohol use

General physical examination

Is directed toward discovering any injuries, especially to the head or spine, resulting from seizure.

(1) Possible fractures, sprains and bruises
(2) Tongue lacerations
(3) Assess for precipitating factors. Search for any systemic illness that may have caused the seizure.
(4) Assess vital signs, note temperature
(5) Assess blood glucose level, if equipment available
(6) Assess for motor system coordination, strength and tone
(7) Assess for slurred, very weak or hoarse speech
(8) Assess for jerky, uncoordinated, slumped or slow movements in posture and gait
(9) Assess for incontinence of bladder and bowel

Differential Diagnosis

Many episodic disturbances of neurologic function may be mistaken for seizures.

The following are several of the more important entities that should be considered.

Syncope

(a) Symptoms: may include some or all of the following: dizziness, diaphoresis, nausea, and "tunnel vision"
(b) Patient is usually aware they are going to faint
(c) Can descr be onset of attack
(d) Cardiac Syncope may occur suddenly without any warning
(e) Injury or incontinence may occur

Pseudoseizures (extremely difficult to distinguish from true seizures)

(a) Pseudoseizures are psychiatric rather than neurogenic
(b) Associated with conversion disorder, panic disorder, psychosis, and impulse control disorder
(c) May occur in response to emotional upset
(d) Attack will occur with witnesses present
(e) Incontinence, injury, postictal confusion and lethargy are uncommon

Hyperventilation syndrome

(a) Gradual onset
(b) Shortness of breath, anxiety, and perioral numbness
(c) May progress to involuntary spasm or the extremities and even loss of consciousness

Migraines

(a) Similar to aura of partial seizures

Movement disorders

(a) Dystonia, chorea, myoclonic jerks, tremors, or tics may occur in a variety of neurologic conditions
(b) Consciousness is always preserved during movements
(d) Involuntary but can be suppressed by patient

Clinical features that help to distinguish seizures from other kinds of mimicking attacks include:

(a) Abrupt onset and termination
(b) Lack of recall
(c) Movements of behavior during the attack generally are purposeless or inappropriate
(d) Attack is followed by a period of postictal confusion and lethargy (except for petit mal or simple partial seizures)

Provide emergency medical care

Treatment

During a seizure

(a) Position the patient on the floor or the ground. Move the furniture with edges away from the patient (GOAL: prevent self-injury)

(b) DO NOT RESTRAIN the patient during a seizure

(c) DO NOT force anything into the patient's mouth

WARNING: Bite sticks have been bitten and swallowed resulting in an airway obstruction. Teeth and jaws have been broken due to forcing a tongue blade into the mouth. NEVER use fingers to keep the patient's teeth apart.

(d) Observe and record time of onset, duration, characteristics of the seizure, and if the patient was incontinent of stool or urine

CAUTION: If the casualty's teeth are clenched, do not attempt to forcibly open the casualty's jaw. Do not restrain the casualty's limbs during seizures.

After a seizure

(a) Maintain an open airway
- (i) Position casualty to maintain open airway
- (ii) Clear airway
- (iii) Insert airway device to assist with maintaining open airway, if needed
- (iv) Support and stabilize cervical spine, if suspected injury

(b) Turn patient on his side if no spinal trauma is suspected and suction his mouth as needed

(c) Administer high-flow oxygen. Use a non-rebreather mask if the patient is breathing on his own. Use BVM with reservoir to ventilate if patient is NOT breathing on his own.

(d) Monitor vital signs

(e) Protect the patient from embarrassment. Cover the patient if exposed or clothes are torn. Keep spectators away from area. If patient loses bladder/bowel control, clean and/or cover the patient as soon as possible.

(f) Establish and maintain intravenous access

(g) Administer IV fluids cautiously

Administer pharmacological interventions

(a) Valium
- (i) Therapeutic effects
  - * Suppress seizure activity in the motor cortex of the brain

* Generalized central nervous system depressant
* Muscle relaxant

(ii) Indications
* To treat grand mal seizures/status epilepticus/seizures lasting greater than 10 to 15 minutes

(iii) Contraindications
* Should not be given during pregnancy - exception may be seizures associated with eclampsia
* Should not be given to patients with hypotension/decreased systolic BP less than 90
* Should not be given to patients with respiratory depression. Respiration less than 10 per minute

(iv) Side effect
* Possible hypotension
* Depression in the level of consciousness

(v) Administration and dosage
* For grand mal seizures/status epilepticus give slow IV in titrated doses. Can be given intramuscular, rectally, or via endotracheal tube if needed. Start with 2.5 mg. Monitor vital signs. If vital signs are stable and patient is still seizing, give another 2.5 mg of Valium slow IV push. Continue until the seizures have stopped. Do not exceed total dosage of 10 mg.

(vi) Incompatibility
* Should not be mixed with any other drug

(b) 50% Dextrose (D50)

(i) Therapeutic effects
* Rapidly restores blood sugar level to normal level

(ii) Indications
* To treat suspected hypoglycemia
* To treat status epilepticus

(iii) Contraindications
* Intracranial hemorrhage
* Known stroke

(iv) Side effects
* Will cause tissue necrosis if it infiltrates

* May precipitate severe neurological symptoms in alcoholics (Wernieke's Encephalopathy)

(v) Administration and dosage

* 50 ml of 50% solution (25 gm) slow IV. Supplied in pre-filled syringes containing 50 ml of 50% solution.
* Determine serum glucose if poss ble prior to administering glucose

(c) Ativan (Lorazepam)

(i) Indications

* Anxiety disturbances or anxiety states: general anxiety disturbances panic disturbances phobic anxiety disturbances
* Adjustment disturbances with anxiety or stress reaction

(ii) Contraindications

* Assess patient periodically
* Safety and efficacy in children under the age of 12 has not been established

(iii) Dosages

* ADULT dose for anxiety is: 2mg - 3mg daily in 3 - 4 divided doses
* RANGE: 1mg - 6mg daily in divided doses
* ELDERLY/DEBILITATED PATIENTS: Initial dose of 1mg - 2mg/day in divided doses. Adjust as needed and tolerated.
* In elderly and/or debilitated patients and in those with serious respiratory or cardiovascular disease, a reduction in dosage is recommended
* In the case of local anesthesia and diagnostic procedures requiring patient co-operation, concomitant use of an analgesic is recommended.
* Ativan sl: Dosage of ativan sublingual should be individualized for maximum effect.

CAUTION: The soldier medic must be proficient and competent in drug administration. This includes knowledge of therapeutic effect, indications, contraindications, side effects, how supplied, administration, and dosage of the drugs.

(d) After the seizure activity is over, assess and treat any injuries suffered during the seizure

(e) Expect lethargy, partial consciousness, and disorientation
(f) If possible, try to determine how long the seizure lasted, what the patient did after the seizure, and what the patient was doing prior to the seizure

Transport considerations

Requirements

(a) Patient with a first time or new seizure
(b) Patient with a seizure that caused injury
(c) Patient with respiratory difficulty
(d) Status epilepticus patient - immediate transport

Maintain an open airway
Patient should be transported on his side while being given supplemental oxygen en route to the medical facility
Suction mouth as needed
Monitor vital signs while en route

Provide on-going management

Maintain the casualty on their side, if necessary
Monitor the casualty's airway
Monitor vital signs to include pulse oximetry, if available
Monitor neurological status

(1) Pupil response
(2) Glasgow coma scale
(a) Eye opening
(b) Verbal response
(c) Motor response

Place the casualty in a quiet, reassuring environment, if possible
Monitor IV fluids.
Reassess pharmacological interventions every 15-30 min.

CAUTION: Sudden, loud noises or bright light may cause another seizure

Document seizure activity

(1) Duration of the seizure
(2) Presence of cyanosis, breathing difficulty, or apnea
(3) Level of consciousness before, during and after the seizure
(4) Preceded by aura (ask the casualty)
(5) Muscles involved (type of motor activity)
(6) Incontinence of bladder or bowel
(7) Eye movement
(8) Previous history of seizures, head trauma, and/or drug or alcohol abuse

Evacuate the casualty by ground, if possible

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked M5 Bag or Combat Medic Vest System, with an obstetric kit. You encounter a pregnant female who is in labor. IAW *The Basic EMT Comprehensive Prehospital Patient Care*, *EMT Prehospital Care*

Stages of Labor

First stage

(1) Begins with the onset of regular contractions
   (a) Contraction time - the span of time from the beginning of a contraction of the uterus to when the uterus relaxes
   (b) Interval time - the span of time from start of one contraction to the start of the next contraction

(2) Rupture of amniotic sac

WARNING: "Meconium staining" - amniotic fluid that is greenish or brownish-yellow rather than clear, is an indication of possible fetal distress during labor.

(3) Appearance of bloody show

(4) Ends with the full dilation and effacement of the cervix

NOTE: In order for a vaginal delivery to occur, the cervix must both thin out (efface) to 100% and open up (dilate) to 10cm (3-4 inches).

WARNING: There is usually time to transport the patient before delivery during this phase.

Second stage

(1) Begins when the baby enters the birth canal

(2) Contractions become stronger

(3) Presenting part appears

(4) Ends with the birth of the baby

CAUTION: Transportation of the patient at this time should NOT BE CONSIDERED. Delivery is imminent.

Third stage

(1) Begins when delivery of baby is complete

(2) Ends with the delivery of the placenta and umbilical cord

Care for Normal Delivery Outside the Hospital

Evaluation of the mother

(1) Ask the mother the following questions

(a) How long have you been pregnant or expected due date?
(b) How long and how often she has been having contractions?
(c) If she has had any bleeding or bloody show?

(2) Check for signs and symptoms that indicate delivery will occur before transport is possible
(a) Head or other presenting part is vis ble (crowning)
(b) Mother tells you "The baby is coming", especially if she is a multiparous woman
(c) Mother feels as if she is having a bowel movement with increasing pressure in the vaginal area
(d) Mother feels the need to push
(e) Hospital is not access ble due to traffic or weather/disaster
(f) Transportation will not become available before anticipated time of delivery

(3) If delivery is eminent with crowning, contact medical officer for decision to commit to delivery on site. If delivery does not occur within 10 minutes, contact medical officer for permission to transport.

Predelivery preparation of the mother

(1) Ensure the mother's privacy
(2) Obtain and open emergency obstetric pack. This will provide all the sterile supplies needed for care of the mother and infant before and after delivery.
(3) In absence of an emergency obstetric pack medic should collect clean sheets and towels, heavy sting or cord (shoelaces) to tie the cord, a towel or plastic bag to wrap the placenta, and clean unused rubber gloves and eyewear
(4) Put on gloves, mask, gown, and goggles for infection control precaution if the conditions permit/as time allows
(5) Position the mother and prepare work space for both delivery and care of the newborn
(a) Position mother lying with knees drawn up and spread apart. Elevate the hips with a folded blanket or pillow.
(b) Create a sterile field around vaginal opening with sterile towels or paper barriers
(c) Have another individual monitoring the airway, render assistance if she should vomit, and provide emotional support

Assist in delivery of the baby

Encourage mother to breathe deeply through her mouth. She may feel better if she pants.

When the infant's head appears during crowning, place fingers on the bony part of skull and exert slight pressure to prevent an explosive delivery. Use caution to avoid "soft spot" (fontanelle.)

If the amniotic sac does not break, or has not broken, use a clamp or your finger to puncture the sac and push it away from the infant's head and mouth as they appear

As the infant's head is being born, determine if the umbilical cord is around the infant's neck

(a) If the umbilical cord is around the infant's neck, slip it over the shoulder or clamp, cut, and unwrap
(b) Umbilical cord must be clamped and cut if it is wrapped too tightly around the infant's neck

After the infant's head is born, support the head, suction the mouth first then the nostrils two or three times with a bu b syringe if available

CAUTION: Use caution to avoid contact with the back of the mouth.

(a) Squeeze the bulb syringe before placing it in the mouth or nose
(b) Slowly release with withdrawal
(c) Squeeze again to expel contents before reinserting

Continue to support the baby's head between contractions while waiting for the rest of the body to be delivered

WARNING: DO NOT pull on the baby's head to assist with the delivery.

As the feet are born, grasp the feet. Wipe blood and mucus from mouth and nose again.

Wrap the infant in a warm blanket and place on his side, with the head slightly lower than the trunk

WARNING: Keep infant warm to prevent hypothermia, which can occur quickly.

Keep infant level with vagina until the cord is cut

Have your partner monitor and complete initial care of the newborn

The infant must be breathing on its own before clamping and cutting the cord, palpate the cord with your fingers to make sure it is no longer pulsating

(a) Use clamps or umbilical tape found in the obstetric kit
(b) Apply the first clamp about 8 to 10 inches from the baby
(c) Place the second clamp 2 to 3 inches below the first, approximately 4 fingers width from infant
(d) Cut the cord between the clamps or knots using sterile surgical scissors

CAUTION: NEVER unclasp a cord once it has been cut, or attempt to adjust a clamp once it is in place.

Observe for delivery of the placenta while preparing mother and infant for transport

When the placenta is delivered, wrap it in a towel and put it in a plastic bag

Place sterile pad over vaginal opening, lower mother's legs, help her hold them together. Transport mother, infant, and placenta to hospital.

Record the birth

(a) Document exact time of birth on the run sheet
(b) Make a double-backed tape bracelet with the time of birth and the mother's full name. Apply to baby's wrist or ankle.

Caring for the newborn

Position, dry, wipe and wrap the newborn in a blanket and cover the head

(a) Place baby in a head-down position
(b) Repeat suctioning the mouth and nose as necessary

Assessment of infant - normal findings

(a) The APGAR score may be used to evaluate the newborn's condition. Perform as soon as the infant's born and 5 minutes later.
(b) Evaluating the adequacy of a newborn’s vital functions immediately after birth
(c) Five parameters: heart rate, respiratory effort, muscle tone, reflex irritability, and color
(d) Each parameter is given a score from 0 to 2
(e) Majority of infants are vigorous and have a total score of 7 to 10

Appearance - note the infant's color. Normal color is pink with some cyanosis of the extremities.

Pulse - determine the infant's pulse rate. The pulse rate should be greater than 100 per minute.

Grimace - evaluate the infant's response to an irritable stimulus. The infant should cry or react vigorously.

Activity - how much is the infant moving? Infant should have good motion in extremities.

Respiration effort (breathing) - the infant should be breathing within 30 seconds after birth (breathing normal or crying)

Stimulate newborn if not breathing

(a) A gentle vigorous rubbing of the baby's back should stimulate breathing, if that fails, snap your index finger against the sole of the feet

(b) DO NOT hold the baby upside down to slap its bottom

Resuscitation of the newborn - after assessment, if signs and symptoms require either cardiac or pulmonary resuscitation, perform the following steps when appropriate

(a) If breathing effort is shallow, slow, or absent, provide artificial ventilations
  (i) 40 to 60 per minute
  (ii) Reassess after 30 seconds
  (iii) If no improvement, continue artificial ventilation and reassessments

(b) If heart rate is less than 100 beats per minute, provide artificial ventilations
  (i) 40 to 60 per minute
  (ii) Reassess after 30 seconds
  (iii) If no improvement, continue artificial ventilation and reassessments

(c) If heart rate is less than 80 beats per minute and not responding to artificial ventilations, start chest compressions

(d) If heart rate is less than 60 beats per minute, start compressions and artificial ventilations
  (i) Chest compressions in the newborn should be delivered at a rate of 120 per minute, mid sternum
  (ii) Give compressions with two thumbs, fingers supporting the back, at a depth of 1/2 to 3/4 inch

CAUTION: This is for newborns only.

(e) Color - if the infant exh bits cyanosis of the face and/or torso with spontaneous breathing and adequate heart rate. Administer oxygen 10 to 15LPM using oxygen tubing held as close as possible, but not directly into the infant's face.

Delivering the placenta

The placenta is normally expelled within minutes after the baby is born. Never pull on the cord to facilitate delivery.

Save the placenta in a container and place it in a plastic bag, or wrap it in a towel or paper and bring it with the mother and baby to the hospital

Emergency care of mother post-delivery - place baby to mothers breast

Up to 500cc if blood loss is normal and well tolerated by the mother following delivery

The soldier medic must be aware of this loss so as not to cause undue psychological stress on him or the new mother

If there is excessive blood loss, massage the uterus

(a) Place fully extended fingers on lower abdomen above pubis and massage lightly with a circular motion over area

(b) If bleeding continues, check massage technique and transport immediately. Provide oxygen and perform ongoing assessment.

Regardless of estimated blood loss, if mother shows signs and symptoms of shock, treat as such and transport prior to uterine massage. Massage the uterine fundus en route to the hospital.

Monitor for complications during labor

Terms and definitions

Breech birth - delivery with the buttocks, feet, or knees appearing as the presenting part

Premature infant - an infant weighing less than 5.5 lbs. or born before the 37th week of gestation

Meconium - a greenish-black to light brown, material that collects in the intestine of a fetus and forms the first stool of a newborn

Abnormal deliveries of childbirth

Premature infants ("Preemie")

(a) Description
- (i) An infant weighing less than 5.5 lbs. or born before the 37th week of gestation
- (ii) Smaller and thinner than a full-term baby
- (iii) The proportion of the head to the body is greater than a full-term infant

(b) Treatment and transport - same as for normal births
- (i) Dry the baby thoroughly as soon as possible after birth
- (ii) Keep warm - absence of fully developed layer of fatty tissue allows rapid cooling and development of hypothermia
  - * Wrap completely, with face exposed
  - * Maintain temperature of room or ambulance at 90-100^{o}
- (iii) Keep mouth and nose clear of mucus by suctioning frequently
- (iv) Provide ventilations and/or chest compressions based upon the baby's pulse and respiratory effort (see Annex F)
- (v) Administer oxygen (humidified, if possible) by directing flow into an improvised tent over baby's face

(vi) Watch the umbilical cord for bleeding. Apply another clamp or tie closer to the abdomen to prevent excessive blood loss.
(vii) Prevent contamination. Wear a gown/mask. Keep bystanders at a distance.
(viii) Handle gently while providing all care
(ix) Inform hospital of premature delivery

Breech presentation

(a) Description
  (i) Presenting part is the buttocks or feet
  (ii) Most common abnormal delivery
(b) Treatment and transport
  (i) Initiate rapid transport upon recognition of a breech presentation
  (ii) Never attempt to deliver the baby by pulling on its legs
  (iii) Provide high concentrations of oxygen
  (iv) Place the mother in a head-down position with the pelvis elevated
  (v) If the body delivers, support buttocks and trunk and prevent an explosive delivery of the head
  (vi) After delivery, care for the newborn, cord, mother, and placenta as in normal delivery.

Prolapsed umbilical cord - a true emergency

(a) Description
  (i) Umbilical cord presents first
  (ii) Oxygen supply to baby is interrupted when the cord is squeezed between the vaginal wall and the presenting part
  (iii) Commonly seen with breech deliveries or small babies (premature births/multiple births)
(b) Treatment and transport
  (i) Perform initial assessment
  (ii) Place mother with her head down and elevate her hips with a blanket or pillow, this will lessen pressure on the birth canal
  (iii) Provide a high concentration of oxygen
  (iv) Gently push on the presenting part to keep pressure off cord, by inserting several fingers of your gloved hand into the vagina. Maintain this position until relieved by the physician at the medical treatment facility.
  (v) Check the cord for pulses and keep it warm with a towel moistened with sterile saline and wrapped again with a dry towel
  (vi) DO NOT attempt to push the cord back inside the mother
  (vii) Transport immediately to a medical facility

(viii) Have your partner obtain baseline vital signs, AMPLE history, and physical exam en route to the hospital, if poss ble

Limb presentation

(a) Description - arm or leg presents first
(b) Foot is the most common in a breach presentation
(c) Limb presentation cannot be delivered in the prehospital setting
(d) Treatment and transport
  (i) Place mother in a head down position with hips elevated
  (ii) Administer a high concentration of oxygen
  (iii) DO NOT attempt to place the limb back into the vagina
  (iv) Transport immediately to a medical facility

Multiple birth

(a) Description - more than one infant is being born (e.g., twins, triplets)
(b) Treatment and transport
  (i) Assist as in a single delivery
  (ii) Clamp and cut the cord of first baby
  (iii) Note time of first birth
  (iv) Assist with subsequent births, cut and clamp each cord. Note the time of each birth.
  (v) Make certain to identify each child and order of birth (1 and 2 or A and B)
  (vi) Provide care for each infant, mother, umbilical cord, and placenta as with a single delivery

Meconium staining

(a) Description
  (i) Greenish or brownish-yellow amniotic fluid. A result of fecal material released from the baby's bowels before birth.
  (ii) Occurs when the infant is distressed due to cord compression, trauma, or other complications while inside the amniotic sac

CAUTION: Appearance of meconium in amniotic fluid is a sign that the infant has a potentially serious problem. Aspiration of meconium by the infant during delivery can cause severe respiratory complications.

(b) Treatment and transport
  (i) Suction the baby's mouth, then nose BEFORE stimulating the baby to breathe. This is to avoid aspiration of amniotic fluid with meconium particles.

(ii) Continue to monitor the airway
(iii) Transport immediately
(iv) Notify hospital of the presence of meconium in the fluid

Predelivery Emergencies

Miscarriage/spontaneous abortion

Fetus and placenta may deliver before the 20th week of pregnancy

(a) Signs and symptoms
  (i) Moderate to severe vaginal bleeding
  (ii) Abnormal cramping
  (iii) Discharge of tissue, blood, and/or blood clots from the vagina
(b) Emergency care steps
  (i) Perform initial assessment
  (ii) Obtain AMPLE history and baseline vital signs
  (iii) Initiate and maintain IV with Normal Saline
  (iv) Treat for shock if indicated
  (v) Administer high concentration oxygen
  (vi) Place sanitary pad over the vagina. Save all used pads.
  (vii) Save all expelled tissue
  (viii) Provide emotional support
  (ix) Transport immediately

Ectopic Pregnancy

(a) 95% of all ectopic pregnancies occurs in a fallopian tube
(b) Usually referred to as a „tubal pregnancy“
(c) Most l kely to occur when the fallopian tube is scarred from infection (PID) or previous abdominal/gynecological surgeries
(d) Signs and symptoms
  (i) Abdominal pain initially localized to one side or the other of the lower abdomen
  (ii) Initially pain is “crampy“ and intermittent in nature
  (iii) As pregnancy progresses, the fallopian tube ruptures and pain becomes constant and diffuse throughout the abdomen
  (iv) Patient may experience shoulder pain which suggests a large hemoperitoneum
  (v) Patient may or may not have vaginal bleeding
  (vi) Patient usually has a history of amenorrhea
(e) Emergency care and treatment
  (i) Maintain airway

(ii) Administer oxygen
(iii) Keep patient supine
(iv) Initiate a large bore IV and administer IV fluids
(v) Keep NPO (nothing by mouth)
(vi) Transport immediately to definitive care facility

Pre-eclampsia (toxemia of pregnancy)

(a) Signs and symptoms
  (i) Hypertension
  (ii) Proteinuria - protein in the urine
  (iii) Elevated blood pressure
  (iv) Excessive weight gain
  (v) Swelling (edema) of the face, hands, ankles, and feet
(b) Emergency care steps
  (i) Notify medical officer immediately
  (ii) Perform initial assessment
  (iii) Obtain SAMPLE history and baseline vital signs
  (iv) Treatment based on signs and symptoms
  (v) Transport patient on her left side

Eclampsia

(a) Signs and Symptoms
  (i) Headaches
  (ii) Visual disturbances
  (iii) Epigastric pain
  (iv) Massive swelling (edema) especially of the face and hands
  (v) Proteinuria (protein in the urine)
  (vi) Seizures - occurrence of seizures clearly marks transition of pre-eclampsia to eclampsia
(b) Emergency care and treatment
  (i) Position on left side. Keep patient quiet and in a darkened room, if poss ble
  (ii) Administer high flow oxygen
  (iii) Initiate and maintain intravenous line
  (iv) Transport to hospital as gently and quickly as possible
  (v) Anticipate seizure activity. Have suction readily available.
  (vi) Pharmacological interventions as directed by MD/PA

Ante partum Hemorrhage (bleeding before delivery)

(a) Three main causes
  (i) Abruptio placenta - premature separation of the placenta from the wall of the uterus during the last trimester of pregnancy. Patient will experience sudden onset of severe abdominal

pain with or without vaginal bleeding. Fetal movement/fetal heart tones are usually absent. The abdomen will be tender and the uterus rigid to palpation.

(ii) Placenta previa - painless vaginal bleeding. Usually bright red. Occurs as the cervix begins to dilate in preparation for delivery and the placenta covers all or part of the cervical canal. Fetal movement continues and fetal heart tones are audible. Uterus is soft and non-tender.

(iii) Uterine rupture - usually occurs during labor. Women at risk are multiparous or have had a previous c-section. Vaginal bleeding may or may not be present. Contractions will have lessened or stopped. Patient will exhibit obvious signs of shock.

(b) Emergency care and management

(i) Regardless of cause of third trimester bleeding, management and treatment are the same.

(ii) Position on left side

(iii) Administer high flow oxygen

(iv) Initiate and maintain at least two large-bore IV's

(v) Treat for shock

(vi) Notify MD/PA Immediately

(vii) Evacuate/transport to definitive care facility

Trauma in pregnancy

(a) Three major causes

(i) Motor vehicle crashes

(ii) Falls

(iii) Penetrating injuries (i.e. gun shot wounds)

(b) Anatomic changes of pregnancy

(i) Compression of abdominal contents into upper abdomen results in a higher incidence of abdominal trauma in association with chest trauma

(ii) Bladder is displaced upward and forward so it is outside the pelvic cavity and is at increased risk for injury

(iii) The obviously enlarged uterus is at risk for injury/rupture

(c) Physiologic changes of pregnancy

(i) Vascular volume increases to support the perfusion of two circulations (patient and fetus)

(ii) Increase in cardiac output to pump increased volume - resting heart rate increases to 15-20 BPM's

(iii) Redistr bution of blood volume with as much as a tenfold increase in blood flow to the pelvic region

(iv) Respiratory changes include an increased need for oxygen due to a higher basal metabolism - increased minute volume
(v) Tidal volume increases along with minute volume to rid the body of the increased CO2 from the patient and fetus
(vi) All of the physiologic changes make it difficult to assess for signs and symptoms of shock and to adequately ventilate the patient

(d) Emergency care and management
(i) Treat the mother first
(ii) Maintain adequate airway
(iii) Administer high flow 02 - oxygen needs are 10 - 20% higher than normal
(iv) Assist with ventilations as needed - remember to provide higher minute volume
(v) Control external bleeding
(vi) Position on left side - lying on the left side will shift the weight of gravid (pregnant) uterus off the vena cava. If immobilized on backboard, tilt board 30 degrees to the left.
(vii) Initiate and maintain IV
(viii) Transport/evacuate to definitive care facility

Identify additional gynecological emergencies

Ectopic pregnancy

(1) Assessment findings
(a) Acute abdominal pain
(b) Vaginal bleeding
(c) Rapid and weak pulse
(d) Low blood pressure
(2) Notify MD/PA
(3) Prepare for immediate transport
(4) Maintain ABC's
(5) Administer high flow 02
(6) Initiate and maintain IV with Normal Saline
(7) Reassess continuously

TERMINAL LEARNING OBJECTIVE

Given a patient medical record, immunization record, supplies, and equipment at Echelon II and below, provide soldier readiness processing for a company size element. Evaluate a patient who presents for an Ambulatory Medical Visit (Sick Call). Performed soldier readiness processing in support of unit deployment. Evaluated a patient who presents for an Ambulatory Medical Visit.

Screen medical records for accuracy and completeness

Primary goal of the medical screener is to provide timely, quality care for active duty personnel with minor medical conditions

(1) Do not function as independent providers
(2) Work under the direct supervision of a medical officer who is respons ble for the care the medic provides

The following guidelines must be followed:

(1) The SOAP format must be used when evaluating a patient
(2) Consult with the supervising medical officer prior to the patient leaving the treatment facility
(3) Know your limitations and immediately refer to an MD/PA any patient with one of the following conditions:
    (a) Febrile illness with temperature exceeding 101° F
    (b) Acute distress such as, breathing difficulties, chest pain, acute abdominal pain, suspected fractures, lacerations, etc.
    (c) Altered mental status
    (d) Unexplained pulse above 120 per minute
    (e) Unexplained respiratory rate above 24 or less then 8 per minute
    (f) Diastolic blood pressure over 100 mm Hg systolic BP less than 90 mmHg

Soldier medic's responsibilities during medical screening procedures (sick call)

(1) Validate identification of soldier
(2) Gather sick slip and review
(3) Sign patient in and pull soldier's medical record (Initiate a replacement record if required)
(4) Complete vital signs and document on appropriate form (e.g. DA Form 5181, SF 600, and DD Form 689
(5) Check for medical profile(s) (temporary or permanent)
(6) Check Over 40 Physical (as required)
(7) Check for eyeglasses and protective mask inserts (as required)
(8) Check for DNA sample
(9) Check for Medical Warning Tags (DA Form 3365)
(10) Refer to medical authority as required
(11) Screen individual IAW APC, Algorithm-Directed Troop Medical Care, HSC Pam 40-7-21, for soldier's chief complaint

(12) Follow algorithm protocol for disposition and/or treatment and annotate on appropriate form
(13) Sign individual out of BAS and follow appropriate disposition after screened by medic or PA evaluation
(14) Clean and set up screening area for next individual reporting to sick call
(15) Secure medical record

Screen immunization records for accuracy and completeness

Screen immunization records

(1) Validate identification of soldier
(2) Ensure all immunizations are current on PHS 731 (Shot Record)
  (a) Refer to medical record if shot record is not available
  (b) Inquire regarding allergic reactions
  (c) Check for Medical Warning Tags
  (d) Refer to immunization site if immunizations are required
(3) Return immunization record to soldier
(4) Secure medical record

Shot Call

(1) Persons who administer vaccinations must be trained in:
  (a) Management of anaphylaxis
  (b) Immunization procedures
  (b) Proper use and maintenance of equipment
  (c) Indications and contraindications for each vaccine
  (d) Storage requirements
  (e) Management and reporting of adverse reactions
  (f) Immunization record maintenance
(2) Patients who report to shot call should be:
  (a) Screened for chronic/acute illness
  (b) Screened for pregnancy
  (c) Screened for medications that might interact with immunizations
  (d) Screened for allergies
  (e) Offer Tylenol to minimize local and systemic shot reactions
  (f) Observed for at least 20 minutes after administration for symptoms of anaphylaxis

Screen for personnel / administrative matters

S-1 personnel (administration) center will screen these records

Validate / inspect Identification Card (DD Form 2A)

Validate / inspect Geneva Conventions ID Card (DD Form 1934)(as required)

Refer for new card(s) as required

Check Identification tags (2 sets) for accuracy

Screen Dental Records

Review date of last dental examination
(1) Ensure Class 1 or 2
(2) Ensure Dental X-rays (Panorex) is present and up to date

Refer to Dental authority as required

Ask and record the following Medical History information on the prescribed form

Purpose of the Chronological Medical Record
(1) To improve communication among all those caring for the patient
(2) To display the assessment, problems and plans in an organized format to facilitate the care of the patient and for use in record review and quality control

Ask and record medical history information
(1) Identifying data
(2) Chief complaint:
  (a) Concise statement
  (b) Primary reason the patient seeks help
  (c) Use patient's own words
(3) Present illness:
  (a) State of health prior to onset of illness
  (b) Nature and circumstances of onset
  (c) Location and nature of pain or discomfort
  (d) Progression
  (e) Treatment received and its effect
(4) Past history:
  (a) Childhood diseases
  (b) Previous illnesses and injuries
  (c) Previous hospitalization and surgery
(5) Family history:
  (a) History of chronic illness
  (b) Familial illness (sickle cell)
(6) Social history:
  (a) Marital status
  (b) Occupational data
  (c) Habits (tobacco, alcohol, drugs)

Use the SOAP Note Format
(1) **S:** SUBJECTIVE DATA: what the patient tells you
(2) **O:** OBJECTIVE - physical findings and lab/ X-ray
(3) **A.:** ASSESSMENT - Your interpretation of the patient’s condition
(4) **P:** PLAN

Perform a patient examination

Determine what is wrong with the patient based on patient's own statements regarding his specific condition.

Determine the chief complaint based on the patient's own statements: Focused examination based on chief complaint

The S.O.A.P. (E. R.) method is the only accepted method of medical record entries for the military

(1) **S:** (subjective) - What the patient tells you
(2) **O:** (objective) - Physical findings of the exam
(3) **A:** (assessment) - Your interpretation of the patients condition
(4) **P:** (plan) - Includes the following
  (a) Therapeutic treatment: includes use of meds, use of bandages, etc.
  (b) Additional diagnostic procedures: any test that still might be needed
(5) **E:** (patient education) - special instructions, handouts, use of medications, side effects, etc.
(6) **R:** (return to clinic) - when and under what circumstances to return.

Components of the patient examination (SOAP note)

(1) Medical History - Gives you an idea of the patient's problem before you start physical exam
  (a) Biographic data
  (b) Chief complaint
    (i) This is the reason for the patients visit
    (ii) Use direct quotes from patient
    (iii) Avoid diagnostic terms
  (c) Observation: begins as soon as the patient walks through the door
  (d) Listening: listen carefully. This will help you get an accurate diagnosis of the problem
  (e) Open ended questions: help you to get more complete and accurate information
  (f) Provider obstacles: your attitude or predetermination may prevent you from making an accurate judgment
  (g) Patient obstacles: the patient has many obstacles to overcome. Patients must have confidence in you.
(2) History of present illness/injury (HPI)
  (a) Duration: when the illness/injury started
  (b) Character: use the patient's words to note character of pain
  (c) Location: have the patient explain, then have them point it out
  (d) Exacerbation or remission: what makes it better or worse and is it constant or does it vary in intensity
  (e) Positional pain: does the pain vary with the change of the patient's position.

(f) Medications/allergies: note any medications whether over the counter or not. Do the medications relate to the problem? Take note of the patient's allergies. **Do not rely on the patient's health record or SF 600.**

(g) Pertinent facts: facts that lead you to your diagnosis. Usually consist of classical signs and/or symptoms.

(3) Another method to take a medical history is by using the key phrase "SAMPLE PQRST"

S: Symptoms
A: Allergies
M: Medicine taken
P: Past history of similar events
L: Last meal
E: Events leading up to illness or injury
P: Provocation/Position - what brought symptoms on, where is pain located
Q: Quality - sharp, dull, crushing etc.
R: Radiation - does pain travel
S: Severity/Symptoms Associated with - on scale of 1 to 10, what other symptoms occur
T: Timing/Triggers - occasional, constant, intermittent, only when I do this (Activities, food)

(4) Past History (PH)
(a) Other significant illnesses
(b) Prior admissions
(c) History of major trauma
(d) Surgery
(e) Childhood illnesses
(f) Neurological history

(5) Family History
(a) This is the pertinent history of diseases of the family within the patient's bloodline.
(b) Any disease traced through the family is important. If no history found, note it on SF600

(6) Social History (SH)
(a) Drugs, recreational
(b) ETOH
(c) Tobacco
(d) Over the counter medications

Disposition Plan

Treat illness or injury within prescribed "Ambulatory Patient Care" (HSC PAM 40-7-21) Algorithms

Definition of algorithm

A step by step procedure for solving a problem

Purposes

(1) Systematic approach to screening patients
(2) Guidance for minimally trained medical personnel to provide a logical conclusion when dealing with medical problems within the limits of his/her training

Algorithm Dispositions Category

(1) **PHYSICIAN STAT/Category I** - medical problem (**Emergency**) exist that may be life threatening
  (a) Requires immediate attention of a physician that can handle circumstance
  (b) Notify the physician assistant and the senior medic of a Category I patient if a physician is not present.
  (a) First aid should be initiated and ambulance transportation arranged if MTF is outside of hospital
(2) **PA STAT/Category II** - medical problem may exists that may develop into a life threatening condition if not evaluated on a priority basis by a physician, PA
(3) **PA TODAY/Category III** - medical condition exists which requires PA evaluation
  (a) Patient will be screened IAW APC-21 algorithm and then sent to PA
  (b) Physician or PA will make final disposition
(4) **SELF-CARE PROTOCOL/Category IV**--condition exists that can be taken care of by individual
  (a) Instructions and/or medications are offered to individual per algorithm protocol
  (b) Individual or screener may elect to override self-care protocol and have the patient seen by medical officer

NOTE: Overriding this protocol usually depends on appearance of individual or if medical problem is chronic and self-care has already been attempted without results.

(5) **HOSPITAL CLINIC REFERRAL/Category V** - medical condition exists that requires evaluation by a specialty clinic (e.g. podiatry, OB/GYN, allergy)
  (a) Medical officer at MTF must make referral
  (b) PA may want to attempt treatment care plan at MTF level if qualified personnel and resources are available

Steps in screening patient complaint

(1) Locate category of chief complaint in table of contents.
  (a) Category of complaint, EXAMPLE - **Ear, Nose, and Throat (ENT)** Complaints
  (b) Complaint, EXAMPLE - **sore Throat**
  (c) Number and page, EXAMPLE - **A-1**, **16**
(2) Review preceding page of algorithm prior to, during, and after patient screening
  (a) EXAMPLE - important information on the algorithm

(b) EXAMPLE - treatment protocol, for instructions and medications to provide patient after screening has been completed

(3) Begin with Block 1 of algorithm and follow arrows depending on patient's response
- (a) EXAMPLE - is there a history of recent throat or neck trauma?
- (b) EXAMPLE - if NO, (go to block 3)
- (c) EXAMPLE - can the patient touch chin to chest?
- (d) EXAMPLE - if NO, (go to block 4)
- (e) EXAMPLE - is temperature 100 F or higher, or is the patient unable to swallow? (Determine ability to swallow by observing the patient)
- (f) EXAMPLE - if NO, (Category III)

(4) If disposition is a Category IV, refer to preceding page for treatment protocol.
- (a) EXAMPLE **- Block 6**, Can the patient clear both ears?
- (b) EXAMPLE - if YES, (Category IV, Treatment Protocol A-1 (6)
- (c) Follow protocol for medication and patient instructions

(5) If disposition is an associated complaint, refer to complaint algorithm and begin at block 1 with new complaint.
- (a) EXAMPLE - **Block 6**, Can the patient clear both ears?
- (b) EXAMPLE - if NO, (Screen for Ear Pain, Discomfort, or Drainage, A-2).

(6) Refer to PA Today, Category III disposition if:
- (a) Complaint not on list
- (b) Patient has already tried the treatment protocol without relief
- (c) Patient will not accept treatment protocol

Information needed in the DD Form 689

(1) MTF personnel are responsible for making sure DD Form 689 blocks 1 through 9 are correctly filled out by a soldier prior to being evaluated by a screener

(2) MTF personnel may fill out a sick slip for a soldier if he is unable to due injury, illness, or reporting directly to the MTF in the event of an emergency

(3) All military forms will be filled out in black ink

(4) **Block 1** - box checked by individual that best fits remarks section (block 8)
- (a) Illness--acute or chronic, (e.g. common cold symptoms, athletes foot, nausea, vomiting, etc.)
- (b) Injury--acute (e.g. direct/indirect trauma within 24 to 48 hours)

(5) **Block 2** - date

(6) **Block 3** - name (e.g. complete last, first, middle initial, Doe, Johnny E.)

(7) **Block 4** - service number. SSN (e.g. complete 9 digits, 000-11-0000)

(8) **Block 5** - grade/rank (e.g. pay grade, E-1, etc.)

(9) **Block 6** - organization and Station (e.g. C Co. 232D Medical Battalion, Ft. Sam Houston, TX 78234)

(10) **Block 7** - in line of duty (e.g. yes/no depending on circumstances)
- (a) Company or unit commander ONLY fills out this block when injury occurs
- (b) Often left blank unless negligence is suspected (e.g. soldier was intoxicated at time of injury, or was not at his/her appointed place of duty at time of injury etc.)

(11) **Block 8** - remarks (e.g. sore throat and cough x4 days; right ankle pain, difficulty walking due to injury x24 hrs.)
- (a) Filled out by individual
- (b) Includes chief complaint (c/o). (e.g. sore throat; right ankle pain)
- (c) Associated illnesses/pain. (e.g. cough; difficulty walking)(d) How long? problem(s) have existed or when injury occurred. (e.g. x4 days; x24 Hrs)

(12) **Block 9** - signature of unit commander.
- (a) First line supervisor or person who is in charge of quarters (CQ) may sign for unit commander (per unit SOP)
- (b) Individual signing the sick call slip must be in individual's immediate chain of command

(13) **Block 10** - in line of duty (e.g. yes/no or left blank).

(14) **Block 11** - disposition of patient.

(15) **Block 12** - remarks (e.g. Quarters x24 Hrs, return in A.M. for follow up or Profiling e.g. no running or marching x5 days)
- (a) Remarks reflect box checked in block 11
- (b) Also indicates:
  - (i) Soldier's arrival time at MTF
  - (ii) Soldier's disposition
  - (iii) Time of release back to unit

(16) **Block 13**--signature of medical officer **ONLY**

(17) Disposition of DD Form 689
- (a) DD Form 689 is returned to individual after medical evaluation has been completed
- (b) Soldier returns original sick slip to first line supervisor or per unit SOP
- (c) Soldier keeps copy of sick slip if quarters or profile given

TERMINAL LEARNING OBJECTIVE

Given an order to deploy, ensure proper immunization and chemoprophylaxis IAW AR 40-562.

Personnel subject to immunizations and required shots

All active duty personnel are subject to immunizations

Specific Requirements

(1) Anthrax - not being administered at present
- (a) Dosage Schedule
  - (i) Full immunity requires six doses administered at 0, 2, and 4 weeks, and at 6, 12, and 18 months, to complete the primary series. This schedule is the only schedule approved by the FDA at this time. Annual boosters are required.
  - (ii) Doses of the vaccine should not be administered on a compressed or accelerated schedule (for example, shorter intervals between doses or more doses than required).
- (b) Medical exemptions can only be granted by a medical officer (MD/PA)
- (c) Adverse Events
  - (i) Localized injection site reactions-redness, pain
  - (ii) Serious adverse reactions are rare

(2) Cholera
- (a) Cholera vaccine is not administered routinely
- (b) Only administered to military personnel, upon travel or deployment to countries requiring cholera vaccination as a condition for entry
- (c) Adverse Events:
  - (i) Pain at injection site, mild systemic complaints, and temperature > 37.7 C
  - (ii) Local reaction may be accompanied by fever, malaise, and headache
  - (iii) Serious reactions, including neurologic reactions, after cholera vaccination are extremely rare

(3) Hepatitis A
- (a) Use Hepatitis A vaccine and immune globulin (IG) according to Army Command Immunization Program (ACIP) and Service - specific guidance
- (b) Adverse events: Rare

(4) Hepatitis B
- (a) Given to health care workers and soldiers PCSing to Korea.

(b) Adverse Events: Pain at injection site, mild systemic complaints, and temperature > 37.7 C

(5) Influenza
- (a) All active duty and reserve military personnel entering active duty for periods in excess of 30 days are immunized against influenza soon after entry on active duty
- (b) The vaccine is provided to all health care providers and others considered to be at high risk for influenza infection
- (c) Adverse Events: Local reactions, fever/malaise (common) severe allergic reactions, and neurological reactions (rare)

(6) Japanese B Encephalitis (JE)
- (a) Specific guidance on indication for use and schedule of immunization in military populations is provided by the each service
- (b) Adverse Events: Fever, headache, myalgias, malaise (common). General urticaria, angioedema, respiratory distress, and anaphylaxis (rare).

(7) Measles, Mumps, and Rubella (MMR)
- (a) Measles and rubella are administered to all recruits regardless of prior history
- (b) Mumps or MMR vaccine is administered to persons considered to be mumps susceptible. Written documentation of physician diagnosed mumps or a documented history of prior receipt of live virus mumps vaccine or MMR vaccine is adequate evidence of immunity.
- (c) Adverse Events: Low grade fever, parotitis, rash, pruritis (mild), deafness (rare)

(8) Meningococcus
- (a) Meningococcal vaccine is administered on a one-time basis to recruits.
- (b) Adverse Events-rare

(9) Plague
- (a) There are no requirements for routine immunization. Plague vaccine is administered to soldiers who are likely to be assigned to areas where the risk of endemic transmission or other exposure is high.
- (b) The addition of antibiotic prophylaxis is recommended for such situations.
- (c) Adverse Events: General malaise, headache, fever, mild lymphadenopathy, and/or erythema, and induration at the injection site

(10) Polio
- (a) A single dose of trivalent OPV is administered to all enlisted recruits. Officer candidates, ROTC cadets, and other Reserve Components on initial active duty for training receive a single dose of OPV unless prior booster immunization as an adult is documented.
- (c) Booster doses of OPV are not routinely administered
- (d) Adverse Events

(i) Paralytic poliomyelitis: more likely in immunodeficient persons, no procedure available for identifying persons at risk of paralytic disease (rare).

(11) Rabies
- (a) Preexposure Series. Rabies vaccine is administered to personnel with a high risk of exposure (animal handlers; certain laboratory, field, and security personnel; and personnel frequently exposed to potentially rabid animals in a nonoccupational or recreational setting).
- (b) Post exposure Series. Rabies vaccine and rabies immune globulin (RIG) administration will be coordinated with appropriate medical authorities following current ACIP recommendations.
- (c) Adverse Events: Anaphylaxis (rare)

(12) Smallpox
- (a) This vaccine is administered only under the authority of the Immunization Program for Biological Warfare Defense
- (b) Adverse events: Person can become infected with the smallpox virus.

(13) Tetanus-Diphtheria
- (a) A primary series of tetanus-diphtheria (Td) toxoid is initiated for all recruits lacking a reliable history of prior immunization. Individuals with previous history of Td immunization receive a booster dose upon entry to active duty and every 5-10 years thereafter.
- (b) Adverse events
  - (i) Local reactions (erythema, induration)
  - (ii) Nodule at injection site
  - (iii) Fever and systemic symptoms uncommon

(14) Typhoid
- (a) Typhoid vaccine is administered to alert forces and personnel deploying to endemic areas. Either oral or intramuscular vaccine is used.
- (b) Adverse Events
  - (i) Local reactions maybe accompanied by fever, malaise, and headache (common)
  - (ii) Nausea
  - (iii) Abdominal cramps
  - (iv) Vomiting
  - (v) Skin rash
  - (vi) Urticaria

(15) Yellow Fever
- (a) Yellow fever immunization is required for all alert forces, active duty personnel or Reserve Components traveling to yellow fever endemic areas.
- (b) Adverse events:
  - (i) Mild headache, myalgia, low grade fever, other minor symptoms

(ii) Immediate hypersensitivity reactions: rash, urticaria, and asthma. Uncommon and occur periodically among people with a history of egg allergies

Chemoprophylactic Requirements

(1) Command medical officers review indications for use and potential adverse effects of specific chemoprophylactic medications prior to use. Current ACIP(Advisory Committee on Immunization Practices) or Control of Communicable Disease Manual recommendations and consultation with the relevant preventive medicine authority are followed for the use of chemoprophylactic agents for the following diseases which have historically been shown to be of military significance:
(a) Influenza
(b) Meningococcal disease
(c) Leptospirosis
(d) Plague
(e) Scrub typhus
(f) Traveler's diarrhea

Malaria

(1) Comprehensive malaria prevention counseling includes mosquito avoidance and personal protective measures (clothing, repellents, bednetting, etc.). Chemoprophylaxis is provided to military and civilian personnel considered to be at risk of contracting malaria. Specific chemoprophylactic regimens are determined by each of the services based on degree and length of exposure and the prevalence of drug resistance strains of Plasmodia in the area(s) of travel.

Group A Streptococcal Disease

(1) Each service develops policies for surveillance and prophylaxis of streptococcal disease at recruit centers

Pre-administration Screening

Medical record screening

(1) What immunizations are required for this individual?
(a) Routine immunizations are identified in AR 40-562 and local policy
(b) Additional requirements specific for deployment:
(i) Based on disease prevalence in specific geographic regions

(ii) Determined by Preventive Medicine using Federal, Department of Defense, and other relevant sources of information

(2) Current immunization status:
- (a) What has been given?
- (b) When?
- (c) Initial series completed?
- (d) Are boosters current?

(3) What immunizations are needed, if any, to meet current update/deployment requirements?

(4) If pre-deployment, is there time to administer all required vaccine series/boosters before date of departure? If not, is an exception to policy needed?

(5) Does the medical record reflect any contraindications for immunization?

Patient screening

(1) It is **YOUR** respons bility to ask the patient about allergies, pregnancy, or current illness **BEFORE** administering the vaccine

(2) Refer patients with any risk factors to the medical officer for disposition

Vaccine Handling, Administrative, and Patient Care Procedures

Vaccine handling

(1) Pre-immunization
- (a) Check expiration date/time
- (b) Evaluate for potential mishandling or contamination
  - (i) Proper storage temperature
    - * Refrigerated vaccines - 35.6 to 46.4^{o} F
    - * Frozen vaccines - 0 to 5^{0} F or as directed by manufacturer.
  - (ii) Evidence of bacterial growth
  - (iii) Color change/clarity of solution

(2) Post-immunization
- (i) Store partially used vials at proper temperature
- (ii) All live virus vaccine containers should be handled as infectious waste and disposed in biohazard containers to be burned, boiled, or autoclaved, follow local SOP.

Administrative procedures

(1) Pre-immunization
- (a) Screen medical record

(b) Select correct equipment (needles and syringes) for immunizations to be administered
(c) Document vaccine lot number and other identifying information as required by local SOP

(2) Post-immunization
(a) Document all vaccines given in patient medical record (SF 601) IAW local SOP
(b) Record immunizations in individual shot record (PHS 731)
(c) Record any reactions or side effects

Patient care procedures

(1) Pre-immunization
(a) Ask about contraindications for immunization (allergies, pregnancy, illness etc.)
(b) Implement appropriate infection control procedures
(c) Explain procedure to patient
(d) Position patient and administer required immunizations

(2) Post-immunization
(a) Inform patient when he is to return for next injection in series/booster
(b) Instruct patient to wait in facility for observation for 20 minutes (or IAW local SOP)
(c) Assure patient is evaluated during and at end of designated waiting period for signs of an adverse reaction

Reactions and possible side effects

Vaccine components can cause allergic reactions in some recipients

Prior to the administration of any immunizing agents, determine if the individual has previously shown any adverse reactions to a specific agent or vaccine component

Vaccine components that can cause reactions include:

(1) Vaccine antigen (a substance that causes the formation of an antibody)
(2) Animal proteins
(3) Antibiotics (e.g., penicillin or penicillin derivatives)
(4) Preservatives (e.g., thimerosal, a mercurial compound)
(5) Stabilizers

The most common animal protein allergen is egg protein

Vaccination during pregnancy

(1) Ideally, all immunizations should precede pregnancy.
(2) Live virus vaccines are contraindicated (Yellow fever, MMR, OPV)

(3) Refer pregnant soldiers to medical officer for disposition.
(4) Breast-feeding - Refer soldier to the medical officer (MD, PA) for disposition

Vaccination with significant illness

(1) Persons should not be vaccinated if they have moderate or severe febrile illness (usually 101o F or higher, per local SOP)
(2) Persons should be vaccinated as soon as they recover from the acute phase of the illness
(3) Minor illnesses, such as diarrhea, mild upper-respiratory infection with or without low-grade fever, or other low-grade febrile illness are not contraindicated to vaccination

HIV positive status – due to compromised immune system, vaccines should not be administered to any patient who has tested positive for HIV, unless specifically ordered by the attending physician with knowledge of the diagnosis

Multiple vaccines

(1) Contraindicated Combinations/Cautions
  (a) Do not administer cholera, plague, and/or typhoid vaccines together unless deploying immediately
  (b) Multiple live virus vaccines may be given the same day. IF THEY ARE NOT GIVEN THE SAME DAY, they must be separated by 30 days. Live virus vaccines are: oral polio, yellow fever, measles, mumps, rubella, and adenovirus.
  (c) Gamma globulin (immune serum globulin) and MMR must be given at least 14 days apart; if closer together, MMR may be partially or completely ineffective in protecting against disease. If closer administration is unavoidable, MMR must be repeated after three months. Gamma globulin administration does not reduce effectiveness of inactivated vaccines.
  (d) A PPD TB test and live vaccines may be given the same day. IF NOT GIVEN THE SAME DAY, the TB test must be deferred for 6 weeks after the live vaccine is given, to prevent a false negative result from the TB test.
(2) No more than one vaccine should be administered in any one anatomical site.

Documentation

DHHS Form PHS 731 is prepared for each member of the Armed Forces and for nonmilitary personnel.

(1) Valid certificates of immunization for international travel and quarantine purposes.

(2) Remains in the custody of the individual who is respons ble for its safekeeping and for keeping it in his or her possession when performing international travel.
(3) Entries based on prior official records have the following statement added: "Transcribed from official U.S. Department of Defense records."
(4) Obtained through normal publication supply channels. The DOD Immunization Stamp is available through medical supply channels.

National vaccine injury compensation program

(1) Information is recorded on PHS Form 731, medical record and on the clinic log or equivalent computer data base. Information includes, name, sponsor's SSN, date of administration, type of vaccine, manufacturer, lot number, and the name, address, and title of person administering the vaccine.
(2) In addition, all health care providers who administer any vaccine containing diphtheria, tetanus, pertussis, measles, mumps, rubella, or polio to either children or adults must provide a copy of the most recent relevant vaccine information materials provided by the DHHS

Issuance of DHHS Form PHS 731 to Military Personnel

(1) At the time of initial immunization of a person entering military services, DHHS Form PH 731 and SF 601, Health Records-Immunization Records, are initiated as outlined below. Written statements from civilian physicians attesting to immunization with approved vaccines, and providing dates and dosages, are accepted as evidence of immunization. Such information is transcribed to official records. Immunizations are recorded on the cited forms, and the forms are maintained as follows.
(2) Army, Navy, and Marine Corps. SF 601 is prepared in accordance with AR 40-66, Medical Records and Quality Assurance Administration, And Chapter 16, NAVMED P-107, Manual of the Medical Department, U.S. Navy. When prepared, SF 601 and DHHS Form 731 contain the SSN as identifying data

Issuance of DHHS Form PHS 731 to Nonmilitary Personnel

(1) At the time of initial immunization of nonmilitary personnel, entries are made on DHHS Form PHS 731, which is retained by the individual. All subsequent immunizations are recorded on this form which can be presented as an official record of immunizations received. In addition to DHHS Form PHS 731, SF 601 (Army, Navy and Marine Corps) or SF 600 (Air Force) is prepared and permanently maintained for each individual. Individuals preparing the DHHS Form PHS 731 and SF 601(600) ensure appropriate entries are recorded on both forms and both forms are current and agree with one another.

TERMINAL LEARNING OBJECTIVE

Given the appropriate equipment and guidance, you will be able to collect specimens for diagnostic testing

General principles for throat culture and sputum collection

Throat culture

(1) A sample of both the mucus and the secretions from the back of the throat is obtained on a cotton tipped applicator and applied to a slide or culture medium, which is then incubated in the laboratory to determine what organism if any is present.

(2) Drug sensitivity determinations may also be done to determine which drug is most effective against a particular organism. This test also determines which drugs the organism is resistant to.

(3) A culture may be done within a matter of hours to rule out the presence of the streptococcus organism. This test does not rule out any other organism. The quick strep test is done in cases of suspected strep infection, so that antibiotic therapy can be initiated.

Sputum specimens

(1) Reasons for cytology study
- (a) Study cells that may be malignant
- (b) Determine organisms causing infection
- (c) Identify blood or pus in the sputum

Collection implications

(1) Sputum is best obtained in the morning, before breakfast, after secretions have accumulated in the respiratory tract during the night

(2) Usually, specimens are collected on 3 successive days

(3) Best to have the patient brush their teeth and rinse their mouth so saliva and oral debris do not contaminate the specimen

(4) Patient should be taught that sputum is matter ejected from the lower respiratory tract through the mouth and that saliva is an unsatisfactory specimen.

(5) Patient should be instructed to inhale deeply and cough deeply on exhalation. About a teaspoon of sputum is needed for a specimen.

(6) Sputum should be coughed directly into a sterile specimen container that is then covered with a sterile lid, properly labeled, and sent to the laboratory

(7) A note should be charted in the patient's record about the character of the sputum, including amount, appearance, and odor

(8) Explain to patient that if sputum cannot be obtained, an induced sputum specimen may be required

NOTE: Precautions should be taken in the care and disposal of sputum. Gloves and a mask should be worn and hands washed after contact with sputum. All tissues are discarded as contaminated material.

Stool specimens

General principles

(1) Reason - stool specimen yields information about the patient related to the functioning of the gastrointestinal system and its accessory organs (See C191W026, Treat Gastrointestinal Symptoms)
(2) Explain the reason for the test to the patient
(3) The best time of day to collect a stool specimen is soon after breakfast
(4) Patient should be instructed that a stool specimen is to be saved
(5) Patient should be instructed to notify the soldier medic as soon as there is an urge to defecate
(6) Give the bedpan to the patient when they are ready
(7) Use tongue blades and wear gloves when transferring the stool specimen to the specimen cup
(8) Some specimens must be kept warm to keep any parasites alive until the specimen is examined in the laboratory
(9) Always label the specimen container with the patient's name, SSN and all pertinent information
(10) Always send an appropriate lab slip with the container

Guaiac test

(1) Purpose - to ascertain the presence of occult blood that is not vis ble
(2) Each method of testing has a specific procedure that must be followed in order to obtain accurate results (i.e. food restrictions and number of days to collect smear)
(3) Manufacturer's instructions or hospital procedure manual should be consulted for specifics

Urine specimens

General principles

(1) Urinalysis is the laboratory examination of a urine specimen. Analysis of the urine is a common way of securing data about a person's health state.
(2) The soldier medic is responsible for instructing the patient about urine collection techniques or for obtaining specimen from the patient
(3) A cooperative patient can be instructed to put specimen into a clean or, in some instances, a sterile container. Care should be taken that the outside of the container is not contaminated.

NOTE: Precautions similar to those when handling blood are appropriate with all body fluids.

Mid-stream (clean-catch)

(1) Reason for obtaining a mid-stream:

(a) Obtain a sample that has been in the bladder an extended period of time
(b) Provide accurate information of the function of the kidneys the presents of pathogenic organisms, and the excretion of electrolytes that are normally use for normal body functions (i.e., potassium)

(2) Patient voids a little urine, which is discarded; the specimen is collected during mid-stream, and the last urine in the bladder is also discarded

(3) Procedure
(a) Wear gloves
(b) For the female
(i) Spread the labia well, and keep them apart until the specimen is obtained.
(ii) Clean the area at the external meatus with sterile gauze or cotton balls and antiseptic soap and water.
* Move the gauze or cotton balls from the meatus toward the anus
* Use one piece of gauze or one cotton ball for each stroke
(iii) Have the patient void about 30 cc then discard this urine
(iv) Position the sterile specimen container near but not touching the meatus and ask them to void forc bly if she is lying down. This prevents collecting a specimen that has dr bbled down across the perineal area.
(c) For the male
(i) Retract the foreskin to expose the glans penis in the uncircumcised male patient
(ii) Clean the area of the external meatus with sterile gauze or cotton balls and antiseptic soap and water
* Move gauze or cotton ball in a circular manner at the meatus, and move down the shaft of the penis a few inches
* Use one piece of gauze or one cotton ball for each stroke
(iii) Have the patient void about 30 cc then discard this urine
(iv) Have patient void directly into the sterile container
(v) Have patient stop before he empties bladder
(vi) Return foreskin to its normal position to prevent swelling and irritation of the glans penis

NOTE: With male patients, a sterile urinal may be used if unable to urinate into cup. With female patients, a sterile bedpan may be used if unable to urinate into cup.

(d) Label specimen container appropriately and send specimen to the laboratory

Blood cultures are used to identify a disease-causing organism especially in patients who spike temperatures for unknown reasons

Procedure

(1) Explain the reason for the procedure to the patient
(2) Gather all supplies and equipment and bring to the patient's bedside
(3) Make the patient as comfortable as possible in bed
(4) If patient is uncooperative or disoriented you may need assistance
(5) Clean the tops of all bottles with a betadine solution
(6) Attach the needle to the syringe
(7) Apply the tourniquet
(8) Don gloves and clean the drawing site with a betadine solution
(9) Wash hands
(10) Draw at least 10 cc of blood from the patient (5 cc's is needed for each bottle)
(11) Loosen the tourniquet
(12) Remove the syringe and needle while applying pressure to the site
(13) Replace the needle on the syringe with another sterile needle
(14) Inject 5 cc of blood into anaerobic bottle and do <u>not</u> allow air to enter the bottle
(15) Replace the needle on the syringe with another sterile needle
(16) Inject 5 cc of blood in the aerobic bottle and while the needle is still in the bottle, disconnect it from the syringe so that air enters the aerobic bottle, if IAW local SOP.
(17) Gently mix the blood with the solution in both bottles
(18) Label both bottles with patient identifying information and type of culture, ie, aerobic or anaerobic
(19) Prepare lab slip and take slips and specimens to the lab immediately
(20) Place a band aid over the patient's venipuncture site

TERMINAL LEARNING OBJECTIVE

Obtain a blood specimen while maintaining aseptic technique and without causing injury to the patient.

General Considerations

Terms and definitions

(1) Venipuncture - the transcutaneous puncture of a vein to withdraw a specimen of blood, start an IV or instill a medication
(2) Palpate - to feel or to examine by hand
(3) Antecubital fossa - hollow or depressed area at the bend of the e bow
(4) Anticoagulant - substance that prevents or delays clotting of the blood
(5) Hematoma - swelling or mass of blood confined to an organ, tissue, or space and caused by a break in a blood vessel

Veins used for drawing blood

(1) Median cubital vein - first choice, well supported, least apt to roll
(2) Cephalic vein - second choice
(3) Basilic vein - third choice, often the most prominent vein, but it tends to roll easily and makes venipuncture difficult

Steps and Procedures to Perform a Venipuncture

CAUTION: Universal precautions for this task will include hand washing and gloves.

CAUTION: Strict adherence to the sharps policy and the use of sharps containers will be utilized during this hands on exercise.

Verify the request to obtain a blood specimen. Check the physician's orders
Select the proper blood specimen tube for the test to be performed. Check local laboratory SOP

(1) The type of blood tube needed will depend on the specific test to be performed
(2) For some tests, an anticoagulant or other additives are present in the tube
(3) Rubber stoppers of the tubes are color-coded for different tests

Prepare label(s)

(1) Stamp label with patient's addressograph plate. If there is no plate, write name, organization, social security number, prefix code, ward or clinic, facility, and date.
(2) Apply to specimen tube

Perform a patient care hand wash/don gloves
Gather equipment

(1) Constricting band
(2) Vacutainer sleeve/holder
(3) Sterile disposable double-ended needle

(a) Single specimen vacutainer needle
(b) Multiple samples - a rubber sheath covers the shaft of the needle. It is pushed up when the blood tube is inserted onto the needle then slips back over the needle holder while tubes are being changed to prevent blood from dripping into holder

(4) Betadine or alcohol wipe or sponge

CAUTION: Always ask the patient if he/she has an allergy to iodine or Betadine before applying.

(5) Protective pad (chux)
(6) Sterile 2 x 2-inch gauze sponge(s)
(7) Band-Aid

Assemble vacutainer and needle

(1) Put short end of needle into threaded hole in vacutainer
(2) Screw tightly using clockwise motion

Insert rubber stoppered end of the specimen tube into vacutainer holder and advance the tube until it is even with the guideline

CAUTION: If the tube is pushed beyond the guideline, the vacuum may released and blood will not be pulled into the tube.

Identify patient

Explain the procedure and purpose for collecting the blood specimen to the patient

CAUTION: Ask patient about allergies (i.e., iodine or alcohol).

Position the patient - sitting or lying

CAUTION: Never attempt to draw blood from a standing patient.

Position protective pad under patient's extended elbow and forearm

Expose area for venipuncture

(1) Roll garment above the e bow
(2) Extend patient's arm with palm up

Select vein for venipuncture - Palpate and select one of the most prominent veins in antecubital fossa

CAUTION: You may need to apply the constricting band at this point for venipuncture site selection.

Prepare sponges for use

(1) Open the betadine or alcohol and 2 x 2 gauze sponge packages
(2) Place them within easy reach (still in the packages)

Apply constricting band with enough pressure to stop venous return without stopping the arterial flow. A radial pulse should be felt

(1) Wrap latex tubing around limb about 2 inches above venipuncture site
(2) Stretch tubing slightly and hold with one end longer than the other
(3) Loop longer end and draw under shorter end so tails are away from site
(4) If a commercial band is used, wrap it around limb as in step 14a and secure by overlapping Velcro ends.
(5) Instruct patient to clench and unclench his fist several times and then hold clenched fist to trap blood in veins and distend them.

CAUTION: Avoid veins that are infected, injured, irritated, or have an IV running distally.

Palpate selected vein
(1) Palpate along length of vein with index finger up and down 1 or 2 inches from selected site in both directions so size and direction of vein can be determined.
(2) Vein should feel like a spongy tube
Clean the skin - moving alcohol/betadine wipe in a circular motion away from selected venipuncture site.

CAUTION: Do not repalpate the vein after cleansing the skin.

Prepare to puncture vein
(1) Remove protective cover from needle
(2) Position needle in line with vein and grasp patient's arm below entry point with free hand
(3) Place thumb of free hand 1 inch below entry site and pull skin taut toward hand
Puncture vein
(1) Align needle, bevel up, with the vein and pierce skin at 15 to 30 degree angle
(2) Decrease angle until almost parallel to skin surface, then pierce vein wall
  (a) A faint "give" will be felt when the vein is entered, and blood will appear in the needle
  (b) If venipuncture is unsuccessful, pull needle back slightly (not above the skin surface), and redirect needle toward vein and try again

CAUTION: If needle is withdrawn above skin surface, do not attempt venipuncture again with the same needle.

  (c) If still unsuccessful
    (i) Release the constricting band
    (ii) Place 2 x 2 gauze sponge over site
    (iii) Quickly withdraw the needle and instruct the patient to elevate arm slightly and keeping the arm fully extended apply pressure to the site for 2 to 3 minutes.

(iv) Notify supervisor before attempting another venipuncture

Collect the specimen

(1) Single specimen
- (a) Hold vacutainer unit and needle steady with dominant hand. Collection tube is positioned against, but not through, the needle
- (b) Place index and middle fingers of other hand behind flange of vacutainer
- (c) Push the tube as far forward as possible with thumb of nondominant hand without causing excessive movement
- (d) Instruct patient to relax and unclench fist after blood has started flowing
- (e) Release the constricting band by pulling on long end of looped tubing or releasing Velcro fastener with the non dominant hand
- (f) When tube is about two-thirds full of blood or blood stops, grasp tube firmly and remove tubes
- (g) Prepare to withdraw needle

(2) Multiple specimens
- (a) Follow same steps for collecting single specimen
- (b) Remove first tube from vacutainer sleeve without dislodging needle position
- (c) Insert second tube into vacutainer sleeve. Push tube as far forward as possible without causing excessive movement.
- (d) Repeat these procedures until the desired number of tubes are filled or blood stops flowing
- (e) Release the constricting band by pulling on long end of looped tubing or releasing Velcro fastener with the non dominant hand.

CAUTION: DO NOT withdraw the needle before the constricting band is released because of potential for heavy blood loss and/or hematoma formation.

- (f) After the last tube is about two-thirds full of blood or blood stops, grasp tube firmly and remove tubes
- (g) Place 2 x 2-inch sponge lightly over venipuncture site
- (h) Withdraw the needle smoothly and quickly. Immediately apply pressure to the site with the 2 x 2-inch sponge, keeping patient's arm fully extended.
- (i) Instruct the patient to elevate arm slightly and keeping the arm fully extended, apply firm manual pressure for 2 to 3 minutes. If the patient is unable to do this for himself, you must do it for him.

If specimen tube contains an anticoagulant or other additive, gently invert tube several times to mix with blood

Apply a band aid to the venipuncture site after the bleeding has stopped

CAUTION: Dispose of needle into sharps container as soon as poss ble or IAW local protocol. DO NOT unscrew needle from sleeve with hands. DO NOT recap needle.

Provide for patient's comfort and safety

(1) Remove protective pad
(2) Roll down patient's sleeve
(3) Reposition patient and raise side rails if patient is in a bed

Dispose of equipment

(1) Remove all the equipment from area
(2) Dispose of used supplies
(3) Store reusable equipment and dispose of needle IAW local SOP
(4) Remove gloves and wash hands

Administrative duties:

(1) Check and complete laboratory form IAW local SOP
(2) Apply prepared label(s) to specimen tube(s)
(3) Document procedure IAW local SOP

Appendix A
Specimen Collection
Competency Skill Sheets

D Stick

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____

Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Gathers equipment.	P / F	P / F	P / F
b.	Identifies patient and explains procedure to patient.	P / F	P / F	P / F
c.	Performs patient care handwash.	P / F	P / F	P / F
d.	Dons gloves.	P / F	P / F	P / F
e.	Removes cap from lancet using sterile technique.	P / F	P / F	P / F
f.	Selects site on patient's fingertip.	P / F	P / F	P / F
g.	Wipes selected site with alcohol swab.	P / F	P / F	P / F
h.	Asks patient to hold arm at side for 30 seconds.	P / F	P / F	P / F
i.	Gently squeezes patient's fingertip with thumb of same hand.	P / F	P / F	P / F
j.	Hold lancing device and places trigger platform of lancing device on same side of finger and presses.	P / F	P / F	P / F
k.	Squeezes finger in a downward motion, wiping off first drop of blood.	P / F	P / F	P / F
l.	While holding strip level, touch drop of blood to test pad.	P / F	P / F	P / F
m.	Begin recommended timing. After 60 seconds, blot blood off test strip into appropriate site on meter. Wait for numeric readout.	P / F	P / F	P / F
n.	Discards lancet into a sharps container.	P / F	P / F	P / F
o.	Removes gloves and discards.	P / F	P / F	P / F
p.	Documents procedure.	P / F	P / F	P / F

Instructor Comments:

Dip UA

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Instructs patient to collect a mid-stream catch UA.	P / F	P / F	P / F
b.	Verbalizes that UA testing must be performed within 1 hour of collection.	P / F	P / F	P / F
c.	Dons clean gloves.	P / F	P / F	P / F
d.	Thoroughly mixes specimen and records color and turbidity.	P / F	P / F	P / F
e.	Removes 1 UA strip from bottle and replaces cap.	P / F	P / F	P / F
f.	Completely immerses reagent areas of the strip and removes immediately. While removing, runs the edge of the strip against the rim of the urine container to remove excess urine.	P / F	P / F	P / F
g.	Holds the strip in a horizontal position to prevent mixing of chemicals from adjacent reagent areas.	P / F	P / F	P / F
h.	Compares test areas to corresponding color chart on the bottle label at the times specified. Holds strip close to color blocks and matches carefully.	P / F	P / F	P / F
i.	Documents results.	P / F	P / F	P / F

Instructor Comments:

Clean Catch UA

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____

Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Collects supplies.	P / F	P / F	P / F
b.	Identifies patient.	P / F	P / F	P / F
c.	Explains procedure to patient and ensures that the patient understands how to perform the procedure if patient is able to perform him/herself.	P / F	P / F	P / F
d.	If patient is unable to perform procedure by him/herself: (1) Washes hands and dons clean gloves. (2) Cleans perineum from anterior to posterior with antiseptic solution. Separation the labia on a female patient. Retracts foreskin on an uncircumcised male. Uses each cotton ball saturated with antiseptic solution one time only. (3) Request that patient void about 20ml, then places the sterile specimen container so that the sides of the labia of the female do not touch. Without stopping the flow, have the patient void a small amount into the specimen cup and then finish voiding into the toilet. (4) Secures lid on container (5) Cleans and returns seat collection, if applicable	P / F	P / F	P / F
e.	Labels specimen.	P / F	P / F	P / F
f.	Documents procedure.	P / F	P / F	P / F

Instructor Comments:

Appendix B
Blood Culture
Competency Skill Sheets

Culture

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____

Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Identifies patient and explains the procedure to the patient. Identifies any patient allergies to betadine or medications.	P / F	P / F	P / F
b.	Gathers equipment.	P / F	P / F	P / F
c.	Performs a patient care handwash.	P / F	P / F	P / F
d.	Cleans the tops of all bottles with a betadine solution.	P / F	P / F	P / F
e.	Dons clean gloves.	P / F	P / F	P / F
f.	Attaches needle to the syringe.	P / F	P / F	P / F
g.	Applies tourniquet to patient's arm and cleans site with a betadine solution.	P / F	P / F	P / F
h.	Draws at least 10cc from patient (5cc for each bottle).	P / F	P / F	P / F
i.	Loosens tourniquet and removes syringe and needle while applying pressure to the site.	P / F	P / F	P / F
j.	Replaces the needle on the syringe with another sterile needle without contaminating the equipment or sticking him/herself.	P / F	P / F	P / F
k.	Injects 5 cc of blood into the anaerobic bottle and does not allow air to enter the bottle.	P / F	P / F	P / F
l.	Replaces the needle on the syringe with another sterile needle without contaminating the equipment or sticking him/herself.	P / F	P / F	P / F
m.	Injects 5cc of blood into the aerobic bottle and while the needle is still in the bottle, disconnects it from the syringe so that air enters the aerobic bottle.	P / F	P / F	P / F
n.	Gently mixes the blood with the solution in both bottles.	P / F	P / F	P / F
o.	Removes gloves and discards.	P / F	P / F	P / F
p.	Labels both bottles with patient information and type of culture.	P / F	P / F	P / F
q.	Documents procedure.	P / F	P / F	P / F

Instructor Comments:

91W10
Advanced Individual Training Course

Clinical Handbook
Supportive Care 3

Department of the Army
Academy of Health Sciences
Fort Sam Houston, Texas 78234

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TERMINAL LEARNING OBJECTIVE

Given the necessary medical equipment in a holding or ward setting. You are providing casualty care as part of an integrated team in a Minimal Care Ward.

Facts about Physical Assessment

The systematic collection and analysis of subjective and objective data (facts). This information is collected to provide a database.
(1) Subjective data
(2) Objective data
(3) Data Base
Assessment is used to establish a database for the patient. It is the basis on which patient strengths and health problems are identified.

The primary source of patient information is the patient.
Other resources include:
(1) Patient's support persons
(2) Patient record
(3) Information from other health care professionals
The physical assessment is focused primarily on the functional abilities of the patient

Purposes of a physical assessment:

(1) To confirm the patient's history or to observe findings not reported in the history
(2) To obtain a physical and mental database on the patient which can be used for nursing intervention
(3) To evaluate or measure the quality of the care (intervention) given to the patient

Considerations in patient preparation for a physical assessment

(1) Evaluate all sources of data
  (a) Patient
  (b) Support people
  (c) Patient record
  (d) Other health professionals
(2) Exam should occur in a quiet, well-lit room with consideration for patient privacy and comfort
(3) Explain all procedures to patient to avoid alarming or worrying patient and encourage cooperation
(4) Ask patient to empty bladder prior to exam and assist with gowning/draping as needed
(5) Discuss confidentiality with patient

Basic techniques used in performing an assessment

The nursing assessment includes two steps:

(1) Collection and verification of data from a primary source (the patient) and secondary source (the family, health care professionals)

(2) The analysis of that data to establish a baseline

Inspection: Observations using visual, auditory, and olfactory senses

Palpation: Technique using the sense of touch to gather information about temperature, turgor, texture, moisture, vibrations, and shape

Auscultation: The act of listening to sound produced within the body with a stethoscope

Percussion: The act of striking one object against another for the purpose of producing sound (tympany, resonance, hyperresonance, dullness, flatness)

Components of the patient assessment

The interview includes:

(1) Chief Complaint
(2) History of Present Illness
(3) Past Health History
(4) Family Health History
(5) Psychosocial History:
  (a) Age
  (b) Sex/Race
  (c) Marital status
  (d) Number of children
  (e) Occupation
  (f) Education
  (g) Religious affiliation
  (h) Living accommodations

General appearance and behavior assessment.

Items to inspect:

(1) Body build (measure height and weight)
(2) Posture
(3) Gait - coordination of movements and pattern of gait.
(4) Hygiene, grooming - note cleanliness, body odors, appropriate dress for age and environment
(5) Signs of illness - note posture, skin color, respirations, nonverbal communications of pain or distress
(6) Affect, attitude, mood - note speech, facial expressions, ability to relax, eye contact, behavior
(7) Cognitive process - note speech content and patterns, appropriate verbal responses

(8) Cognitive function - an intellectual process by which one becomes aware of, perceives, or comprehends ideas. It involves all aspects of perception, thinking, reasoning, and remembering.

Vital Signs

(1) Temperature:
- (a) May vary with the time of day
- (b) Oral: 98.6 degrees Fahrenheit is considered normal
- (c) Rectal temperature is most accurate. Temperature of > 100.4 = fever.

(2) Blood Pressure
- (a) Measure the blood pressure in both arms
- (b) Use the correct sized cuff
  - (i) To determine cuff size, the length of the cuff should be 80% of the upper arm circumference and be two-thirds the width of the upper arm.
  - (ii) An improper size will give an inaccurate reading. A higher inaccurate reading will be obtained if too small a cuff is used. conversely, a lower inaccurate reading will be obtained if too large a cuff is used.
- (c) Normal range 95-140 mmHg systolic, 60-90 mmHg diastolic

(3) Pulse
- (a) Palpate pulses for at least 30 seconds
- (b) Normal adult pulse 60-80 beats/minute
- (c) Note the number of irregular beats per minute
- (d) Peripheral pulses are graded on a scale of 0-4 by the following system
  - (i) 0 = Absent, no pulse
  - (ii) +1 = Not easily felt, thready, weak
  - (iii) +2 = Difficult to palpate, stronger than +1
  - (iv) +3 = Normal. Easily felt, not easily obliterated with pressure
  - (v) +4 = Strong, bounding, unable to obliterate with moderate pressure

(4) Respiration
- (a) Count number of respirations taken in 15 seconds and multiply by 4
- (b) Normally 12-20 resp/min

(5) Measure pulse oxygen saturation (See LP C191W059, Cardiac Monitoring)

Head-To-Toe Assessment

(1) Integumentary System
- (a) Ask if patient has been exposed to harmful environmental materials or increased sun exposure, has recent skin changes, or is currently taking medications
- (b) Normal skin color
  - (i) Varies among races and individuals

(ii) Ranges from pinkish white to various shades of brown
(iii) Exposed areas may vary in color with unexposed areas
(iv) Healthy dark skin has a reddish undertone; buccal mucosa, tongue, lips, nails, normally appear pink

(c) Skin color assessment:
(i) Cyanosis - dusky bluish color
* Inspect ears, lips, inside of mouth, hands, nailbeds
* Caused by respiratory or cardiac diseases, or cold environment (decreased oxygenation)
(ii) Jaundice - yellowish color
* Inspect skin, mucous membranes, sclera
* Caused by liver disease (increased bilirubin)
(iii) Pallor - paleness
* Inspect face, lips, conjunctival, mucous membranes
* Caused by anemia (decreased hemoglobin) or inadequate blood circulation
(iv) Erythema - redness
* Inspect facial area, localized areas
* Caused by blushing, alcohol intake, fever, injury, infection

(d) Vascularity - bleeding or bruising
(i) Ecchymosis - collection of blood in subcutaneous tissues causing purple discoloration
(ii) Petechiae - small hemorrhagic spots caused by capillary bleeding

(e) Lesions - note presence of wounds, scars, rash, etc.
(f) Note skin temperature and moisture - normally warm and dry
(g) Skin turgor - fullness or elasticity of skin
(h) Edema - excess fluid in tissues characterized by swelling with shiny skin
(i) Edema scale
0 = None
+1 = Trace
+2 = Moderate
+3 = Deep
+4 = Very deep

(2) HEENT - Head, eyes, ears, nose, throat (inspection and palpation)
(a) Head - size, shape, symmetry, tenderness
(b) Eyes

(i) Symmetry, alignment and movement of eyes, eyelashes, eyebrows, eyelids, pupils
(ii) Visual acuity and peripheral vision
(iii) Pupils are normally black, equal in size, round, smooth

(c) Ears
(i) Hearing; shape, size, symmetry of external ear
(ii) Palpate external ear for pain, edema, lesions
(iii) Ear canal should be smooth and pinkish - examine for wax, discharge, foreign bodies

(d) Nose/sinuses
(i) Assess for nasal patency by occluding one nostril at a time
(ii) Examine mucous membranes for color, presence of exudate, growths
(iii) Inspect nasal septum for intactness, deviation
(iv) Palpate frontal and maxillary sinuses for pain, edema

(e) Throat - inspect lips, gums, teeth, tongue, hard and soft palates
(i) Uvula normally centered and freely movable
(ii) Tonsils normally small, pink, symmetrical in size

(3) Nervous System / Neurological Assessment
(a) Mental Status
(i) Orientation level - person, place, time
(ii) Observe patients' appearance, general behavior, response to questions, ability to speak clearly
(iii) Note memory recall - short and long term

(b) Pupillary reaction to light, accommodation, convergence
(c) Motor ability - note abnormal balance, gait, or coordination
(d) Sensory function - response to pain, light touch

(4) Thorax and Lungs (Respiratory)
(a) Inspection
(i) Shape of chest
(ii) Breathing patterns
(iii) Rate of respirations
* Bradypnea: Rate less than 12 respirations per minute
* Tachypnea: Rate greater than 20 respirations per minute
* Dyspnea: Breathlessness or difficult breathing
* Orthopnea: Shortness of breath when lying down
* Kussmaul: Faster and deeper respirations than normal without pauses
* Cheyne-Stokes: Cyclic pattern which progresses from slow and shallow to fast and deep with a gradual return to

slow and shallow respirations, followed by a period of apnea

(b) Palpation - detect areas of sensitivity, chest expansion during respiration

(c) Auscultation - auscultate anterior and posterior fields (upper, middle, and lower lobes)

(i) Rales (crackles): fizzing sound produced by moisture in airways

(ii) Rhonchi: Coarse, gurgling sound in bronchial tubes - low pitched - resulting from air flow across passages which are narrowed by fluids, tumors, swelling

(iii) Wheezes: Type of rhonchi - squeaky sound - high pitched

(iv) Cough: Note whether the cough is productive or non-productive and character of secretions

(5) Cardiovascular System

(a) Inspect the neck and epigastric areas for visible pulsations

(b) Palpate

(i) Pulses

(ii) Edema

(iii) Capillary refill:

* Acceptable - < 3 seconds

* Abnormal or sluggish - > 3 seconds

(c) Auscultate - Heart sounds

(a) Rate - per minute

(b) Rhythm - regular or irregular

(6) Gastrointestinal

NOTE: Be sure the patient has an empty bladder and that he/she is lying flat with knees slightly flexed.

(a) Inspect the general contour of abdomen

(i) Flat

(ii) Protuberant

(iii) Concave

(iv) Note local bulges/scars, note color of scars

(b) Auscultate

NOTE: This is done before palpation because the latter may alter the character of bowel sounds.

(i) Note character of bowel sounds (clicks and gurgles produced by movement of air and flatus in GI tract)

* Auscultate each of four quadrants in a clockwise systematic manner

* Normal frequency ranges from 5-34 bowel sounds per minute, described

as audible, hyperactive, hypoactive, or inaudible

NOTE: Listen for 5 minutes in order to distinguish inaudible from audible bowel sounds.

(c) Palpate all four quadrants and note:
- (i) Muscular resistance
- (ii) Tenderness
- (iii) Enlargement of organs
- (iv) Masses

NOTE: Appetite, usual elimination patterns, character of stool, recent changes, artificial orifices, and use of laxatives should be assessed during the interview.

(7) Genitourinary
- (a) History of urinary elimination
  - (i) Unusual patterns of elimination
  - (ii) Recent changes
  - (iii) Aids to elimination
  - (iv) Present or past voiding difficulties
- (b) Inspection
  - (i) Urine
    - * Color
    - * Clarity
    - * Odor
  - (ii) Urethral orifice for signs of inflammation/discharge
  - (iii) Always inspect testis if patient presents with abdomen pain or urinary tract symptoms
- (c) Palpate suprapubic areas and note:
  - (i) Tenderness
  - (ii) Distension

(8) Musculoskeletal
- (a) Inspection and palpation
  - (i) Gait
  - (ii) Muscles
    - * Bilateral symmetry
    - * Tenderness
    - * Strength/tone
  - (iii) Joints
    - * Note active/passive range of motion (ROM) - Joint movements include flexion, extension, hyperextension, abduction, adduction, pronation, supination.
    - * Palpate joints and note - Pain, swelling, nodules, crepitation (grating sound heard on movement)

(iv) Bones
* Note normal contour or prominences, symmetry
* Document pain, enlargement, and changes in contour

Guidelines for documentation of physical assessment

Each body system is assessed for normal and abnormal findings, and documentation should occur in an organized manner
Data should be recorded leg bly using correct grammar
Use only standard approved medical abbreviations
Subjective data should be recorded using patient's own words
Do not record data using nonspecific terms, i.e. adequate, good, normal, poor, large - be specific

Nursing Documentation

TERMINAL LEARNING OBJECTIVE
Using approved forms, accurately document patient status, vital signs and care rendered using the SOAPE format.

Purposes

(1) Primary - Insures that AMEDD personnel have a concise and complete medical history of active-duty personnel
(2) Assists AMEDD officers in advising commanders on personnel use and retention
(3) Appraises Army-wide physical fitness and readiness
(4) Communication - a means of communicating and sharing information on the patient's status throughout the hospitalization with health care team members
(5) Legal documentation - a legal document and admiss ble in court as evidence
(6) Patient care planning - each professional working with the client has access to the client's baseline and ongoing data. Client responds to the treatment plan from day-to-day is documented. Modifications of the plan of care are then based on this data.
(7) Audit - patient records may be reviewed to evaluate the quality of care received and to improve the quality of care as indicated
(8) Research - patient records may be studied by researchers to learn how best to recognize or treat health problems
(9) Education - clinical manifestations of particular health problems, effective treatment methods, and factors affecting client goal achievement are documented
(10) Historic document - past information may be pertinent concerning a patient's healthcare
(11) Reimbursement record - insurance companies, Medicare, and Medicaid require written record of treatments, equipment, and diagnostic procedures before they pay the agency
(12) Decision - analysis-information from the medical record review can be used to provide information for strategic planners to identify needs and/or resources

Confidentiality of medical information

(1) Medical confidentiality of all patients will be protected as fully as possible.
(2) Medical information used for disease
    (a) Diagnosis
    (b) Treatment
    (c) Prevention
(3) Access given to
    (a) The patient
    (b) Patient care personnel
    (c) Medical researchers
    (d) Medical educators

(4) Personnel not involved in a patient's care or in medical research will not have access to patient information unless the following situations apply -
  (a) Access required by law (court order)
  (b) Access needed for hospital accreditation
  (c) Access authorized by patient
(5) Disclosure of medical information
  (a) All requests done in writing except in emergency situations
  (b) Handled by patient administrator
  (c) Not provided by the 91W

Medical Record Documentation Procedures

Required procedures for making entries

(1) Leg bly typed or handwritten
(2) In black or blue black ink
(3) Signed by the individual who made the entry
  (a) Military personnel - Sign with full payroll signature, rank, MOS, branch of service
  (b) Civilians - Sign with full payroll signature, title, GS (paygrade)
(4) Date in day-month-year sequence
(5) Capitalized at the beginning
(6) Written with present or past tense verbs
(7) Recorded ASAP
(8) Abbreviated IAW AR 40-60
(9) Must be clear, concise, and objective
(10) Include patient identification on patient identification block. Use addressograph or write information leg bly.
  (a) Name
  (b) Rank
  (c) Social security number
  (d) Ward/clinic
  (e) Admission date/date of visit
  (f) Hospital register number (in patient's only)

Correction procedures for an entry error

(1) DO -
  (a) Draw a single line through information
  (b) Write "Error," the date, and your initials above entry or follow local SOP
(2) DO NOT -
  (a) Erase or use correction fluid
  (b) Skip lines
  (c) Write between lines
  (d) Chart for someone else
  (e) Leave blank lines above signature

Content of Medical Record Entries

Done by direct patient care providers

Nursing Entries on the Patient Record

(1) Concise, comprehensive nursing assessment
(2) Up-to-date care plan individualized to the client
(3) Nursing notes
(4) Flow sheets
(5) Graphic sheets
(6) Medication records
(7) Intake and output record
(8) Physician and nursing discharge summary
(9) Other components of patient record include admission sheet, patient history, physician's orders and progress notes, consultations, and laboratory and x-ray reports

Types of Nursing Documentation (Chart)

(1) Source-oriented record
  (a) Separate form for each group of health care (e.g., nursing, medical, laboratory, x-ray department)
  (b) Chronological notes are kept on each form
  (c) Easy to find record and continue CHARTING
  (d) Record of care is fragmented and difficult to trace overall care
  (e) If the Kardex-Care plan is not retained, the care plan must be duplicated in a narrative format
(2) Focus charting
  (a) Patient-centered approach to organizing the narrative portion of the medical record
  (b) Column format to separate topic words or "focus" statements from the body of the note
  (c) Enhances communication among health team members
  (d) Quality improvement auditing more efficient
(3) Charting by exception is a short hand documentation method
  (a) Must have well-defined standards of practice;
  (b) Only significant findings and „exceptions" are documented n narrative notes
  (c) Requires well-established guidelines and clinical experience to identify exceptions
  (d) Advantages: Decreased charting time, greater emphasis on pertinent data, standardized assessment, and enhanced communication within the healthcare team
(4) Flow sheets are used with almost all charting formats for documentation of routine care and repeated monitoring
  (a) Recognized as a useful tool for efficiency
  (b) Data retrieval easier for quality improvement monitoring

(c) Pertinent items from the flow sheet are summarized into the patient care record
(d) Duplicate charting is discouraged

(5) Computer charting
(a) Computer capacities are in operation for the admission assessment tool
(b) Key client data is automatically recorded
(c) Adds to the client data base as new data are identified and modifies the plan of care accordingly
(d) Receives a work list indicating the treatment, procedures, and medications necessary for the client throughout the shift
(e) Documents care immediately using the computer terminal at the client's bedside

(6) Problem-Oriented Medical Record (POMR) emphasizes the patient and his or her health problems
(a) All health professionals record on the same forms
(b) Interdisciplinary team works together in identifying a master list of client problems
(c) Logical way in which to organize information
(d) A "problem" is a condition that requires further observation, diagnosis, assessment, and intervention
(e) A care plan is developed, based on the identified problem

SOAP/SOAPIE Documentation

(1) S: Subjective Data
(a) What the patient tells you about his problem
(b) Usually expressed in the patient's own words. For example, "My throat hurts", or "I am in pain from my broken leg." Patient may have many complaints.
(c) Important to record exactly what the patient states is the problem

(2) O: Objective Data
(a) Observations made by the 91W that support or are related to the subjective data
(b) Record what you observe about the patient. For example, the patient in pain may speak with a loud, agitated voice, or his facial expressions (grimace) might indicate pain. He may be guarding the painful area. Or he may be very quiet and not moving much which would aggravate the pain. Vital signs may indicate increased pain such as pulse is elevated or blood pressure is elevated.
(c) Important to record all observations made of the patient to include any physical findings

(3) A: Assessment
(a) This is your interpretation of the patient's problem/condition
(b) Subjective and objective data is carefully analyzed to reach conclusions regarding the patient's complaint or problem

(4) P: Plan
  (a) The plan for dealing with the problem/compliant or situation is recorded here
  (b) This may include comfort measures, pharmacological interventions, notifying the physician, patient education, etc.
  (c) Your plan should be concise and should reflect all the information gathered to this point
(5) Some documentation formats include the I (Intervention) and E (Evaluation) in addition to the SOAP acronym
(6) I: Intervention
  (a) This is your plan of action carried out as described
  (b) For example, patient was medicated with 50 mg of Demerol for his complaint of leg pain rated as 10/10
  (c) Be sure to record all interventions
(7) E: Evaluation
  (a) This is a record of the effectiveness of your plan and intervention
  (b) For example, patient states that his leg pain is now rated 5/10 30 minutes after receiving the Demerol
  (c) Important to record patient's response to the intervention whether the intervention was successful or not
  (d) Unsuccessful intervention requires re-assessment of the problem.
(8) Documentation should be concise, factual, organized and contain pertinent information

Record special procedures (diagnostics, therapeutic, nursing)
(1) Time
(2) Name of procedure
(3) Person performing procedure
(4) Instruction to patient
(5) Description of what was done
(6) Lab, x-ray reports
(7) Patient's condition before, during and after procedure. This is extremely important.

Record all medications and/or treatments
(1) Record vital signs (TPR/BP) before and after all treatments
(2) Record all medications and/or treatments with responses

Record discharge note
(1) Date
(2) Time
(3) Manner (ambulatory, wheelchair, stretcher)
(4) Accompanied (parents, ward personnel)
(5) Medications and/or treatments with schedules
(6) Discharge information instructions
(7) Statement that address patient's understanding of discharge plan
(8) Follow-up visits

End of Shift Reporting

(1) Means of communication between the outgoing and incoming staff of each shift
(2) A change of shift report if given by a primary RN or caregiver to the primary RN or caregiver replacing him or her
(3) May be given in written form, orally in a meeting, or may be audiotaped
(4) Information shared during the end of shift report should include:
  (a) Basic identifying information about each patient-name and current diagnosis
  (b) Current health status to include changes in medical condition and patient's response to medical therapy
  (c) Current orders (especially newly changed orders or new medications)
  (d) Diagnostic tests or schedule surgeries
  (e) Summary of each newly admitted patient including his or her diagnosis, age, plan of treatment, and general condition

Medical Record Forms

SF 600 - chronological record of medical care

SF 511 - chronological inpatient record of TPR, BP and weight

DD Form 792, 24 hour I & O worksheet

(1) Chronological record of intake (front side of SF 511) -
  (a) Oral intake
  (b) IV intake
  (c) irrigation
  (d) Blood products
(2) Chronological record of output (back side of SF 511) -
  (a) Urine
  (b) Nasogastric
  (c) Chest
  (d) Emesis
  (e) Stools
  (f) Other

SF 558 - Used instead of SF 600 in emergency rooms

SF 510, Nursing notes

Other forms

(1) Lab slips
  (a) Miscellaneous
  (b) Chemistry

(c) Urinalysis
(d) Hematology
(e) Culture

(2) Special procedure forms
(a) SF 519-B x-ray request
(b) SF 520 EKG request
(c) Be sure to write the provider's name as well as the name and phone number of the ward/clinic sending the request on all request forms!

(3) Sick-Call forms (Refer to LP Perform Medical Screening C191W017)
(a) DA Form 5181-R Screening of acute medical care
(b) DD Form 689 Individual sick slip

Introduction to Composite Health Care System (CHCS)

The Composite Health Care System (CHCS) provides world-wide automated medical information system support to all MTFs in providing comprehensive, high quality health care to uniformed service personnel, retirees and dependents.

Functions performed by CHCS

(1) CHCS serves more than 9 million beneficiaries of the U.S. military health care worldwide
(2) CHCS is installed in more than 700 DOD hospitals and clinics providing health care to the men and women of the armed services and their dependents, veterans, and the retired military community
(3) CHCS:
(a) Shorter waits for patients
(b) Faster reporting of diagnostic test results
(c) Improved use of the medical and professional resources
(d) Significant improvements in the quality of patient care
(4) CHCS Functions:
(a) Patient registration, admission, disposition, and transfer
(b) Inpatient activity documentation
(c) Outpatient administration data
(d) Appointment scheduling
(e) Laboratory
(f) Drug/laboratory test interaction
(g) Quality assurance
(h) Radiology
(i) Clinical dietetic administration
(j) Pharmacy
(k) Results reporting and order entry
(l) Ad Hoc reporting
(m) Managed Care
(n) Interfaces to 40 other clinical and administrative systems

Benefits to Medical Professionals

(1) For the health care professional, CHCS saves staff time and increases job performance and satisfaction
(2) CHCS offers medical professionals:
  (a) Immediate notification of test results
  (b) Improved drug inventories, allowing pharmacies to monitor shelf life and drug quantities
  (c) Reduced paperwork
  (d) Improved accuracy of laboratory and radiology results
  (e) Easy access to complete patient care information and administrative data
  (f) Better quality control with enhanced capabilities for monitoring productivity and quality assurance data
  (g) Increased productivity and utilization management control
  (h) Improved communication with administrative staff and other health care professionals
  (i) Improved clinic administration
  (j) Improved documentation and accountability for patients' medication orders
  (k) Better utilization of staff resources due to improved scheduling
  (l) Systematic tracking of a patient's treatment course

Cost Benefits

(1) CHCS reduces costs by eliminating duplication and tracking of data to assist in determining the most successful medical strategies
(2) CHCS provides:
  (a) Immediate access to information, allowing prompt evaluation of cost effectiveness and resource utilization
  (b) Systematic tracking of a patient's treatment course, thereby reducing duplicative services, tests, and drug orders
  (c) Treatment pattern comparisons, helping providers to determine the most successful and cost-effective clinical protocols
  (d) Improved data collection for outcome studies

Benefits to Patients

(1) On the patient level, CHCS increases quality of care by providing complete, accurate, and secure information about patients and their care
(2) CHCS means:
  (a) Authorized users can immediately access private, personal medical records, thus facilitating appropriate patient care and saving lives in emergency situations
  (b) Improved access to health care services due to better scheduling and resource utilization
  (c) Fewer repeated tests and examinations thanks to improved reporting and data management
  (d) More responsive scheduling and handling of appointments

(e) More personal service from MTF staff and health care providers
(f) Improved health care professional/patient relationships
(g) Shorter waits for pharmacy services
(h) Fewer delays in receiving radiology and lab tests and results
(i) Constantly updated and accurate patient registration information
(j) Greater patient satisfaction with service and results
(k) Facilitates enrollment to TRICARE programs

TERMINAL LEARNING OBJECTIVE

Give the necessary medical equipment in a holding or ward setting, provide casualty care as part of an integrated team in a Minimal Care Ward by administering medication to a casualty without causing further injury or illness.

Drug effects-mechanism of action

(1) Predictable chemical reaction-how the drug works
(2) Changes the physiological activity of the body as the drug bonds chemically at a specific site called a receptor site
(3) Mechanism of actions of drugs include
  (a) Drugs that fit the receptor sites well with a good chemical response are called „agonists“
  (b) Drugs that attach at a receptor site and become chemically inactive with no drug response is called an „antagonist“
  (c) Drugs that attach at a receptor site and produce a slight chemical reaction are called „partial agonists“

Drug actions

(1) Therapeutic effects
  (a) Expected positive effect of drug
  (b) Single medication may have many therapeutic effects such as aspirin which is an analgesic, reduces inflammation, reduces fever and reduces clot formation
  (c) Some drugs have very specific effects such as antihypertensive medications have a therapeutic effect of controlling high blood pressure. Antibiotics treat bacterial infections.
(2) Side effects
  (a) Unintended secondary effects
  (b) May or may not be harmful to the patient
  (c) Side effects of a drug may outweigh the benefits
  (d) Patients may stop taking a drug because of unpleasant side effects, i.e. codeine prescribed to control coughing but causes constipation.
(3) Toxic effects
  (a) Caused by intake of high doses of medications, ingestion of drugs not intended to be ingested, such as topical medications, or when a drug accumulates in the system due to impaired metabolism or excretion
  (b) May be lethal, depending on the action of the drug
  (c) Usually seen in accidental poisonings and intentional drug overdoses i.e., intentional ingestion or accidental administration of a large amount of a narcotic may cause severe respiratory depression and death.
(4) Allergic Reactions
  (a) Unpredictable response to a drug
  (b) May be mild or severe

(c) Mild allergic reactions include hives, rash, pruritus (itching of the skin), rhinitis (stuffy, runny nose) and wheezing.
(d) Severe or anaphylactic reactions are characterized by sudden constriction of the bronchiolar muscles, swelling the throat, severe wheezing and shortness of breath. Without immediate life saving measures, this reaction progresses rapidly and death can occur within minutes.
(e) Always ask patient about allergies to medications. Check unconscious patients for a medical alert bracelet or medal indicating a medication allergy prior to administering medications

(5) Drug tolerance and dependence
(a) Occurs when the patient receives the same drug for long periods of time and requires higher doses to produce the same effect.
(b) For example, patients who take pain medications over a long period of time may develop a tolerance for the drug and require higher doses to achieve the same effect.

(6) Drug interactions:
(a) One drug modifies the action of another drug. Drug interactions are common in patients who take many medications
(b) A drug may potentiate or diminish the action of other drugs
(c) May alter the way a drug is absorbed, metabolized or eliminated from the body
(d) Drug interactions may or may not be desirable. For example, combining alcohol with other central nervous system depressants is not desirable. Combining diuretics and vasodilators act together to lower blood pressure in a desirable way.

Routes of drug administration

Non-parenteral medication administration

(1) Drugs are introduced into the body by different routes, each serving a specific purpose
(2) Oral administration of medications is the most common method
(a) Advantages
(i) Convenience
(ii) Economy
(iii) The drug need not be absolutely pure or sterile
(iv) A wide variety of dosage forms are available
(b) Oral medications include tablets, capsules, liquids, and suspensions
(c) Disadvantages include
(i) Inability of some patients to swallow
(ii) Slow absorption
(iii) Partial or complete destruction by the digestive system
(d) Other routes associated closely with oral administration

(i) Sublingual - under the mouth
(ii) Buccal - The drug is placed between the cheek and gum and is quickly absorbed directly into the blood stream

(3) Inhalation
(a) The introduction of medications through the respiratory system in the form of a gas, vapor, or powder
(b) Divided into three major types:
(i) Vaporization - the drug is changed from a liquid or solid to a gas or vapor by the use of heat, such as steam inhalation
(ii) Gas inhalation- almost entirely restricted to anesthesia
(iii) Nebulization - the drug is nebulized into minute droplets by the use of compressed gas

(4) Topical Ointments
(a) Examples of topical preparations
(i) Creams
(ii) Lotions
(iii) Shampoos
(b) Topical application serves two purposes:
(i) Local effect-the drug is intended to relieve itching, burning, or other skin conditions without being absorbed into the bloodstream and
(ii) Systemic effect-the drug is absorbed through the skin into the bloodstream.
(iii) Example: Nitroglycerin paste

(5) Suppositories
(a) Rectal is preferred to the oral route when patient is
(i) Nauseated or vomiting
(ii) Unconscious, uncooperative, or mentally incapable
(b) Vaginal suppositories, creams, or tablets are examples of vaginal preparations that are inserted into the vagina to produce a local effect

Parenteral medications are those introduced by injection

(1) All drugs used by this route must be
(a) Pure
(b) Sterile
(c) Pyrogen-free (pyrogens are products of the growth of microorganisms)
(d) Liquid state

(2) Several types of parenteral administration
(a) Subcutaneous
(i) The agent is injected just below the skin's cutaneous layers
(ii) Example: Insulin
(b) Intradermal

(i) The drug is injected within the dermis
(ii) Example: Purified protein derivative (PPD)

(c) Intramuscular
(i) The drug is injected into the muscle
(ii) Example: Procaine penicillin G

(d) Intravenous
(i) The drug is introduced directly into the vein
(ii) Example: Intravenous fluids / antibiotics

(e) Intrathecal/intraspinal
(i) The drug is introduced into the subarachnoid space of the spinal column

Bulk and Unit Dose Medications

Bulk drugs

(1) Commonly called floor stock or clinic stock
(2) Description - large quantity of drug from which individual medication dose is removed
(3) Storage guidelines
(a) Once individual dosage is removed, it can NEVER be returned to bulk container
(b) Individual dosage drawn from bulk drug container will be disposed of IAW local SOP
(c) Some medications require controlled temperature storage ranges

Unit dose

(1) Description - single dose of a drug in a tablet, capsule, liquid, or injectable form that is prepackaged by the pharmaceutical company or pharmacy
(2) Storage guidelines
(a) Normally found in medication cart
(b) If still in original wrapper/unused condition, can be returned to medication cart/storage

Internal and topical (external) medications must be stored separately to prevent accidental use of the inappropriate medication

(1) Injectable
(2) Ointments
(3) Tablets are stored on separate shelves

Specific medications kept in secured (limited access) area

(1) All narcotics
(2) All medications with abuse potential, e.g., diazepam (Valium)
(3) All pre-filled hypodermic needles and syringes

Guidelines and Principles

General guidelines

(1) Check the physician's/PA orders
(2) Wash hands prior to touching any medication
(3) Five patient rights
  (a) Right patient - verify patient's identity by comparing the patient's medical record, provider's orders, and the medical bracelet (hospital) or ask patient to state full name
  (b) Right medication - compare provider's orders, medication sheet, and medication label
  (c) Right dose - ensure amount of medication ordered by the provider is measured correctly (i.e., graduated medicine cup, syringe, number of tablets, number of milligrams, etc.)
  (d) Right time - administer medications at the prescribed time as per provider's orders
  (e) Right route - administer medication via the route specified in the provider's order (i.e., PO, IM, IV, etc.)
(4) Check medical records, allergy bands, medic-alert tags and ask patient for medication allergies

Principles of Medication Administration

(1) Only administer medication that you have prepared or received from the pharmacy as unit dose
(2) Be familiar with all potential medication effects, both therapeutic and non-therapeutic. This information can be found in the:
  (a) Manufacturer's medication insert that accompanies prepackaged medications
  (b) Local SOP
  (c) If available, Physicians Desk Reference (PDR) or RN's Drug Book

CAUTION: If there is any doubt about administering a medication, check with supervisor, nurse, physician, or pharmacist.

(3) Administration route and time will be followed IAW provider's orders

WARNING: NEVER alter medication dosage ordered by physician!

(4) If in doubt about medication dose, time, administration route, or if a medication is missing, check with supervisor, nurse, physician, PA or pharmacist
  (a) MD/PA's order and medication label DO NOT match exactly
  (b) Illegible medication label; return to pharmacy or follow local SOP
(5) Check all medications label 3 times to ensure that the correct medication is being prepared for administration

(a) When removing the medication or container from the storage area
(b) When preparing the medication dose
(c) When returning the container to the storage area

(6) Check the expiration date of the medication
(7) Handle only one medication at a time
(8) While administering medication, do not perform other duties (i.e., obtain vital signs, dressing changes)
(9) Prepare the prescr bed dose of medication
(a) Tablet or capsules - transfer the prescr bed dose of tablets or capsules to the medicine cup or if unit dose- open the package and give directly to the patient
(b) Liquids - pour the prescribed dose of liquid medication into the medicine cup. Small amounts of liquid medication should be drawn up in a syringe
(c) Powders - pour the correct dose of powdered or granulated medication into the medicine cup
(i) Pour the required amount of water or juice into a paper cup
(ii) Reconstitute the medication at the patient's bedside

WARNING: Never directly touch oral medications. Some medications can be absorbed through the skin, also the medication will become contaminated.

(iii) The medic may assist the patient in taking the medication if the patient is physically unable

WARNING: DO NOT administer oral medications to patients with a decreased level of consciousness. Check with supervisor for instructions.

CAUTION: Positive patient ID required prior to administering medication.

(10) Patient Identification
(a) Patient Identification (Hospital)
(i) Be sure the patient has received and wears an identification band
(ii) Check the information on the band to see that it is correct
(iii) Check the tag on the bed or wall and door, and make sure the patient is properly identified
(iv) Ask the patient to state his/her name
(v) Check patient ID band for medication allergies and other pertinent information
(vi) In a hospital environment, have patients return to their bedside to receive medication
(b) Patient Identification (Clinic)
(i) Have patient state name

(ii) Ask patient if he/she has any allergies to medications

Dosage

Systems of drug measurement (definitions)

(1) Metric System
- (a) Decimal system, each basic unit of measure is organized into units of 10
- (b) Basic units of measure are the meter (length), the liter (volume), and the gram (weight)
- (c) Small or large letters are used to designate the basic units:
  - (i) Gram = g or GM
  - (ii) Liter = l or L
- (d) Small letters are abbreviations for subdivisions of major units:
  - (i) Milligram = mg
  - (ii) Milliliter = ml

(2) Apothecary System
- (a) One of oldest systems of measurement
- (b) Seldom used, but some companies include apothecary measure in addition to the metric
- (c) Basic units of measure include grains (weight), and minims, drams, and ounces (volume)
- (d) Measurements are approximates and a 10% variance has become acceptable in preparation and administration of most medications
- (e) Uses roman numerals and fractions
  - (i) ss = ½
  - (ii) Abbreviation or symbol for a unit of measure is written before the amount of quantity

(3) Household measurements
- (a) Familiar to most people
- (b) Used when more accurate systems of measure are unnecessary
- (c) Basic units of measure include drops, teaspoons, tablespoons, cups, and glass for volume; and ounces and pounds for weight

Dosage

(1) A dose is the amount of medication to be administered

(2) Posology is the study of dosage and the criteria that influence it

(3) United States Pharmacopeia and National Formulary (USP-NF) states the doses given are the average therapeutic doses or "usual adult doses"

(4) The following terms are used in connection with doses:
- (a) Therapeutic dose

(i) Amount needed to produce the desired therapeutic effect
(ii) Also referred to as „usual adult dose„
(iii) Calculated on an average adult about 24 years old, weighing approximately 150 pounds

(b) Dosage range
(i) The range between the MINIMUM amount of drug and the MAXIMUM amount of drug required to produce the desired effect
(ii) Many drugs, such as antibiotics, require large initial doses that are later tapered to smaller amounts
(iii) MINIMUM dose, the least amount of drug required to produce a therapeutic effect
(iv) MAXIMUM dose, the largest amount of drug that can be given without reaching the toxic effect
(v) TOXIC dose, the least amount of drug that will produce symptoms of poisoning
(vi) Minimum lethal dose - The least amount of drug than can produce death

Factors Affecting Dosage

(1) Many factors that affect the dose, method of administration, and frequency of the dose
(2) Although a physician prescribes the amount to be given, you need to know how and why these quantities are determined
(3) Two primary factors that determine or influence the dose are age and weight
(4) **Age** is the most common factor that influences the amount of drug to be given
(a) An infant would require much less than an adult
(b) Elderly patients may require more or less than the average dose, depending upon the action of the drug and the condition of the patient
(5) **Weight** has a more direct bearing on the dose than any other factor, especially in the calculation of pediatric doses
(6) Other factors that influence dosage are:
(a) Genetic make-up: The genetic structure of the individual may cause peculiar reactions to medications in some patients
(b) Habitual use: Some patients must take medications chronically, causing their bodies to build up tolerance to the drug. This tolerance may require larger doses than their initial doses to obtain the same therapeutic effect.
(c) Time of administration: Therapeutic effect may be altered depending upon time of administration. Example: Before or after meals.
(d) Mode of administration: This has a definite impact on the dose. Example: Injections

Principles

Patient observation

(1) Remain with patient until medication is swallowed completely, injected, or applied topically
(2) If patient refuses medication
  (a) Remove medication from the patient's room
  (b) Report the omission to the nurse/supervisor
  (c) Offer the medication again in five minutes
  (d) If refused a second time, record the omission per SOP and document the reason for the omission in the nursing notes

CAUTION: DO NOT leave medications at the patient's bedside without a specific physician's order to do so.

(3) Observe for medication effects and/or side effects
  (a) Medical History
    (i) Before administering medications, review the patient’s medical history for possible indications or contraindications for medication therapy
    (ii) Disease or illness may place patient at risk for adverse medication effects
    (iii) Long-term health problems or surgical history may require medications
  (b) History of Allergies
    (i) Allergic to medication
    (ii) Food allergies should be documented
    (iii) If patient is allergic to shellfish, they may be sensitive to any product containing iodine such as Betadine or dyes used in radiological testing
  (c) Medication History
    (i) Length of time drug has been taken
    (ii) Current dosage schedule
    (iii) Any ill effects experienced
    (iv) Drug data: action, purpose, normal dosage, routes, side effects and nursing implications for administration and monitoring
(4) If the patient has an adverse reaction. (Rash, itching, and nausea/vomiting/diarrhea are common examples of adverse reactions.)

WARNING: Anaphylaxis is the most severe form of adverse reaction to a medication.
  (a) Stop dosage immediately
  (b) Assess patient's airway, breathing, circulation
  (c) Inform nurse/physician on duty immediately

Medical documentation

(1) Record administration of medication IAW SOP. Minimum information needed is
  (a) Name of medication given
  (b) Dosage of medication
  (c) Time given
  (d) Route of administration
  (e) Patient's reaction (effects/side effects)
  (f) Name of person who administered medication

(2) Record the omission of a medication on the appropriate medical forms whenever a scheduled medication is not administered IAW local SOP

Medication Errors

Any event that causes the patient to receive inappropriate drug therapy (medications) or failing to receive appropriate drug therapy (medications)

Can be made by anyone involved in the prescribing (MD/PA), transcribing of the order, preparing and dispensing (pharmacist, RN, 91W) or administering the medication (RN, LPN, 91W)

Strict adherence to the five „rights“ of medication administration helps to prevent errors

Errors should be acknowledged as soon as they are discovered or known to have happened and reported immediately to the appropriate people for patient follow-up

Professional and ethical obligations to your patients mandate that you report all medication errors

TERMINAL LEARNING OBJECTIVE

Give the necessary medical equipment in a holding or ward setting. You are providing casualty care as part of an integrated team in a Minimal Care Ward.

Facts related to the pain experience
Pain is the body's defense mechanism that indicates the person is experiencing a problem.

Classic definition of pain: Pain is an abstract concept which refers to a personal, private sensation of hurt, a harmful stimulus which signals current or impending tissue damage, and a pattern of responses which operate to protect the organism.

Leading nursing definition: Pain is whatever the experiencing person says it is, existing whenever he/she says it does.

Origins of Pain
Physical Origin
(1) Cutaneous pain
  (a) Superficial, usually involves the skin or subcutaneous tissue
  (b) Example: A paper cut that produces sharp pain with a burning sensation
(2) Somatic pain
  (a) Diffuse or scattered and originates in tendons, ligaments, bones, blood vessels, and nerves
  (b) Example: Strong pressure on a bone or damage to tissue that occurs with a sprain causes deep somatic pain
(3) Visceral pain
  (a) Poorly localized and originates in body organs (thorax, cranium, abdomen)
  (b) Visceral pain usually presents as referred pain, which is perceived in an area distant from the point of origin
  (c) Example: Pain associated with a myocardial infarction is frequently referred to the neck, shoulder, or left arm

Psychogenic pain
(1) Physical cause for the pain cannot be identified
(2) Pain can be just as intense as pain that results from a physical origin
Responses to Pain
Physiologic (involuntary)
(1) Sympathetic response- moderate and superficial
  (a) Increased blood pressure, pulse, and respirations
  (b) Pupil dilation
  (c) Muscle tension and rigidity
  (d) Pallor
  (e) Increased adrenaline output
  (f) Increased glucose
(2) Parasympathetic response to severe and deep pain
  (a) Nausea and vomiting
  (b) Fainting and unconsciousness

(c) Decreased blood pressure
(d) Decreased pulse rate
(e) Prostration - a condition of extreme exhaustion and inability to exert oneself further, as in heat prostration or nervous prostration
(f) Rapid and irregular breathing

Behavioral

(1) Moving away from painful stimuli
(2) Grimacing, moaning, and crying
(3) Restlessness
(4) Protecting the painful area and refusing to move

Affective

(1) Examples - exaggerated weeping and restlessness, withdrawal, anxiety, depression, and fear
(2) Person's past experience with pain and sociocultural background play an important role in emotional responses to pain
(3) Emotions tend to intensify the reactions to pain
(4) Explains why similar circumstances causes a different pain responses in different groups of people

Acute Versus Chronic Pain

(1) Acute pain
  (a) Generally rapid onset
  (b) Varies in intensity from mild to severe
  (c) May last for a brief period up to a period of 6 months
  (d) Protective in nature, warns of tissue damage or organic disease
  (e) Once underlying cause is resolved, pain disappears
  (f) Examples: pricked finger, sore throat, post surgical pain
(2) Chronic pain
  (a) Last 6 months or longer and interferes with normal functioning
  (b) May be limited, intermittent or persistent

Factors Affecting the Pain Experience

Culture

(1) Cultures vary in what is an acceptable response to pain
(2) An assessment of the cultural influences of:
  (a) The meaning of the pain event
  (b) Ways in which patient choose to demonstrate and cope with the pain experience
  (c) Responsibilities in pain relief

Religion

(1) Religion can effect patient's views on their pain experience
(2) Some see pain as a purifying experience. This becomes a sense of strength for them. these patients might refuse pain medications.
(3) Pain might be viewed as a punishment from God. These patients might become angry and resentful.

Anxiety and other stressors

(1) Anxiety leads to muscle tension and fatigue which can also increase pain intensity
(2) Factors which may increase anxiety:
  (a) Strange environment in the hospital
  (b) Support people not available
  (c) Fear of the unknown

Past pain experience

(1) Whether the patient has experienced pain in the past and qualities of that experience profoundly affect new pain experiences
(2) Some patients have never known severe pain and have no fear of pain. Patients who have had severe pain without adequate pain relief may have increase sensitivity to pain

Components of Pain Assessment

Characteristics of pain (PQRST)

(1) Provokes pain
  (a) Aggravating factors
  (i) Question the patient on what makes the pain increase
  (ii) Example: "Does your pain become worse upon exertion?„
  (b) Alleviating factors
  (i) Ask patient to describe what makes pain go away or lessen.
  (ii) Determine what pain relief methods have worked in the past. For how long these pain relief methods used?
(2) Quality
  (a) Encourage the patient to descriptive words to describe his/her pain
  (b) Examples: sharp, stabbing, pressure, dull, aching
(3) Radiation (Location)
  (a) Instruct the patient to point the area of pain. Patients with chronic or visceral pain might have difficulty localizing specific area.
  (b) Clearly document areas of pain. Utilize a diagram of the body to be more specific if needed.
(4) Severity
  (a) Since pain is subjective, it is very important to have patients rate the pain they are experiencing. This becomes extremely important when assessing the effectiveness of pain medications.
  (b) Various scales may be used. One example is a 0-10 scale:

0 No Pain
1
2 Mild Pain
3
4
5 Moderate Pain
6
7 Severe Pain
8
9

10 As bad as it can be Pain
(c) Ask patient to rate pain at various stages
(i) At its worse
(ii) At its least
(iii) After pain medication

(5) Time
(a) Duration
(i) Ask how long the patient has been experiencing the pain
(ii) If pain is intermittent, ask how long the pain lasts and how often does pain occur
(b) Chronology
(i) Have the patient describe how the pain first began
(ii) Question if the pain has change since the onset
(iii) Identify if the pain is worsening or improving
(iv) Is the pain intermittent or constant?

(6) Associated phenomena
(a) Identify if there were any factors that seem to relate consistently to the pain
(b) Examples: Increased anxiety before pain begins

Physiological responses

(1) Sympathetic stimulation – occur with acute pain
(2) Parasympathetic stimulation - with prolonged severe pain
(3) Responses to watch: Vital signs, skin color, perspiration, pupil size, nausea, muscle tension, anxiety

Behavioral Responses

(1) Posture, gross motor activities
(a) Assess if the patient guards an area
(b) Does the patient make frequent position changes?
(c) Posture and gross motor activities increased in acute pain, might be absent with chronic pain
(2) Facial features - Does the patient have a pinched look? Are there facial grimaces? Look of fatigue?
(3) Verbal expression - Does patient sigh, moan, scream, cry, repeat same words?

Methods used in the Relief of Pain

Non-pharmocologic relief measures

(1) Distraction
(a) Techniques for distraction
(i) Visual - Staring at an object or spot and describing it in detail, reading or watching television
(ii) Auditory - listening to music
(iii) Tactile/Kinesthetic – Holding or stroking a loved one, pet, or toy, rocking back and forth, slow breathing

(iv) Project Distraction – Playing a games, creative work, writing in a journal
(b) Requires the patient to focus on something other than the pain
(c) Best used before the pain starts or becomes moderate to severe. Is not to be used as the only intervention for severe pain. Can be used as adjuvant treatment.

(2) Imagery – example of mind-body interaction-concentrates on an image that involves one or all of the senses , gradually becomes less aware of the pain. Does not work as the only intervention for severe pain.

(3) Relaxation - techniques to relieve anxiety and reduce stress. Includes listening to music while taking slow deep breaths and consciously relaxing each muscle group. Should be utilized early in the pain experience. Patient should practice technique.

Pharmocologic

(1) Non-narcotic analgesics (aspirin, Tylenol, NSAIDS)
(a) Used for mild to moderate pain
(b) Works best on muscle and joint pain.
(c) Produces analgesia at the peripheral nervous system.
(d) Major Side-effects: Nausea, vomiting, increased bleeding tendencies.

(2) Narcotic analgesic (morphine, codiene, demerol)
(a) Used for severe pain.
(b) In sufficient dose, considered capable of relieving pain, in most cases
(c) Analgesia produced at the central nervous system
(d) Major side-effect: Respiratory depression, sedation and addiction

(3) Adjuvant analgesics (antidepressants, anticonvulsants)
(a) Used usually in combination with opioids especially when there is a neurologic component as one of the causes of the pain.
(b) Mechanism of action not clearly understood, may block pain transmission or may suppress abnormal nerve endings from injury to nerve tissue (anticonvulsant).

91W Solider Medic' s Role in Pain Management

Obtain a thorough baseline pain assessment

Assess pt's beliefs and misconceptions regarding pain management

Provide patient education regarding pain management regime

(1) Assure the patient that every step will be taken to treat their pain effectively. Do not let the patient think he/she is being left alone to DEAL with the pain.

(2) Correct any misconceptions regarding pain medication that the patient might have. Reinforce information regarding newly prescribed medication.

In the hospitalized patient, document the patient's response to the pain medication. This is very important for the ongoing accurate assessment of the patient's pain.

When administering narcotic analgesia, monitor for signs and symptoms of overdose, especially respiratory depression and severe sedation. Obtain baseline respirations before administering medication.

Inform health care team if pain management regime is not effective

TERMINAL LEARNING OBJECTIVE

Given a patient/casualty with known symptoms the soldier medic will be able to identify and use available drugs.

Sources of Drugs

Plants
(1) Belladonna
(2) Opium

Animals
(1) Heparin
(2) Insulin

Minerals
(1) Iodine
(2) Iron (Fe + 2)

Microorganisms
(1) Ant biotics--penicillin, tetracycline
(2) Vaccines

Synthetics
(1) Aspirin
(2) Acetaminophen

Use of Drugs

Maintain health
(1) Treatment of disease--ant biotics and chemotherapeutic (anticancer) agents are commonly used in medicine today
(2) To relieve symptoms--drugs which act to relieve symptoms but do not cure the patient. Instead, they help to make the patient more comfortable in order for the patient to work or function.

Prevent disease
(1) Immunization--vaccines and toxoids are used to prevent disease
(2) Nutrition--vitamins and minerals

Diagnose disease-
Radiopharmaceuticals are used to diagnose many diseases

Prevent pregnancy

Factors that Affect the Desired Effect of a Drug

Age-
As a general rule, the very young and the very old require smaller doses than the average adult

Size-

(1) Weight--obese or larger patients may require a higher dose of medication to achieve the same effect than a thin or smaller patient

(2) Surface area--this takes into account both the patients height and weight for the determining of the proper dose of medication. This method is more accurate than using just the patient's weight and is routinely used for antineoplastic (cancer) medications

Sex-

Females have more adipose (fat) cells than males, in proportion to their body weight. As a result, females may need higher doses of fat-soluble drugs to achieve the same effects. The utilization and metabolism of various hormones is also effected by gender.

Time of administration-

Time of day a medication is administered may alter the amount of drug that is absorbed. For example, many antibiotics are have a higher degree of bioavailability if taken before meals (on an empty stomach), while some actually work better if taken after a meal

Drug interactions-

Interaction between two or more drugs may affect the overall effectiveness of each drug

(1) Synergistic--the joint action of drugs. The combined effect is greater then the sum of the individual effects. (1 + 1 = 3)

(2) Additive--the combined effect is equal to the sum of the effects of the individual agents. (1 + 1 = 2) (i.e., 1 Aspirin and 1 Acetaminophen given together for fever.)

(3) Antagonistic--the combined effect is actually less then the action of either agent (1+1=0)

Tolerance-

After taking a medication for some time, a patient may require a larger dose to obtain the desired effect (opiates, cocaine, amphetamines, and barbiturates). This is especially true for narcotic analgesics. Cross-tolerance--the use of one drug can cause tolerance to another--addicts can develop tolerance to sedatives and anesthetics

Genetic factors-

Different ethnic groups may metabolize certain drugs at different rates

Physical condition of patient-

Weak, ill, or debilitated patients may require less medication. Patients in severe pain may require a higher dose of analgesics to relieve the pain

Routes of administration-

Route of administration may determine the rate of absorption, or the amount of drug that is metabolized

Psychological condition of the patient-

In some cases, if a patient believes that the medication will work, the patient may obtain a positive clinical response. This is termed the placebo effect

Routes of Administration

Oral

(1) Tablet; capsule; liquid
(2) Usually taken for systemic effect
(3) Must pass through stomach and be absorbed
(4) Delayed onset of action

Sublingual

(1) Dissolved under tongue
(2) Taken for systemic effect
(3) Rapid onset of action
(4) Avoids gut

Buccal

(1) Dissolved in pouch of cheek
(2) Taken for systemic effect
(3) More rapid onset of action than oral route, but less than sublingual route
(4) Avoids gut

Rectal

(1) Cream, suppository, or liquid
(2) Used for local and systemic effect
(3) Useful in unconscious or pediatric patients

Vaginal/urethral

(1) Cream or suppository
(2) Used for local effect
(3) Should not irritate tissue
(4) May be absorbed

Inhalation

(1) Sprays, gases, powders
(2) Used for local or systemic effect
(3) May be administered nasally or orally

Topical

(1) Sprays, creams, powders, gels, ointments, patches
(2) Used for local or systemic effect

Parenteral

(1) Advantages
    (a) By-pass the G.I. tract

(b) Rapid onset of action
(c) Prolonged action, depending on vehicle
(d) Used for local or systemic effects

(2) Disadvantages
(a) Painful to the patient
(b) Inconvenient
(c) Once medication is administered, you can't recover the drug
(d) May expose nursing staff to blood or body fluids

(3) Types of parenteral routes:
(a) Intravenous (I.V.)
(i) Most rapid onset
(ii) Drug injected directly into vein
(b) Intramuscular (I.M.)
(i) Drug injected deep into muscle
(ii) If aqueous base, absorption is rapid, but slower than the intravenous route
(iii) If oil base, absorption is slow
(c) Intradermal (I.D.)
(i) Drug injected into dermal layer of the skin
(ii) Used for diagnostic tests
(d) Subcutaneous (SQ/SC)
(i) Drug injected into the fatty layer below skin, but not into the muscle
(ii) Route is slower than the IM route, because the subcutaneous tissue is less vascular than the muscular tissue
(iii) Must be nonirritating or it may cause tissue necrosis
(e) Spinal (Intrathecal, Epidural, & Caudal) - Drug injected into or near the spinal cord

Adverse Reactions to Drugs

Direct toxicity

(1) Blood dyscrasias--damaging to the components of the blood (RBCs, WBCs, platelets etc.)
(2) Hepatotoxicity--damaging to the liver (liver is organ which detoxifies drugs)
(3) Nephrotoxicity--damaging to the kidney (kidney eliminates water soluble toxic agents)
(4) Teratogenicity--causes birth defects (drugs can cross the placental barrier. Fetus most

susceptible in first trimester of the female pregnancy. Referred to as teratogenic.)

Allergic reactions--hypersensitivity

(1) Caused by prior exposure to agent or similar drug-sensitization

(2) Reaction varies from rash to anaphylaxis

Side effects

(1) Most drugs affect more than one system

(2) Some side effects are minor, others are so distressing as to cause the patient to stop taking the drug (i.e. vomiting, diarrhea)

Drug dependence

(1) Psychological--patient convinced that he/she has a need for the drug. The mind tells the patient that they must have the drug to function normally

(2) Physiological--body develops a need for the drug, if drug is taken away, patient goes through withdrawal, tremors, nausea, vomiting, and convulsions. The body exhibits physical signs of the need for the drug. The classic example is a narcotic addict

Medications for use by the Soldier Medic

Oral medications

For fever and pain

(a) Acetaminophen-nonnarcotic analgesic and antipyretic

(i) Indications
* Mild pain
* Fever

(ii) Contraindications- patients with hypersensitivity to the drug

(iii) Side effects - rare
* May cause liver damage in high doses or unsupervised long-term use
* Patients should be warned that excessive ingestion of alcohol while using acetaminophen could result in severe liver damage.

(iv) Dosage
* Adults: 325-650 mg P.O. (by mouth) every 4-6 hours or 1 Gram every 6-8 hours as needed for fever or mild pain
* May also be given as a rectal suppository-650 mg every 4-6 hours as needed for mild pain or fever
* Maximum daily dose (24 hours) should not exceed 4 grams.

(v) Considerations
* Use cautiously in patients with history of chronic alcohol use-liver damage has occurred with therapeutic doses
* Many over the counter products contain acetaminophen. Be aware of this when calculating total daily dose

(vi) Common brand name: Tylenol

(b) Ibuprofen-nonsteroidal anti-inflammatory drug (NSAID)

(i) Indications
* Mild to moderate pain relief to include headaches (analgesia)
* fever reduction (antipyretic)

(ii) Contraindications
* Patients with hypersensitivity to the drug
* Patients with known ulcer disease

(iii) Side effects – Increases bleeding time for 8 hours
* Gastrointestinal (GI) pain
* Nausea
* Occult gastrointestinal bleeding

(iv) Dosage
* For mild to moderate pain 400-800 mg P.O. every 6-8 hours
* For fever, 200-800 mg P.O. every 6-8 hours
* Maximum daily dose (24 hours) 3200 mg.

(v) Considerations
* Take with meals or milk to reduce GI side effects
* Do not use with aspirin or alcohol, which may increase risk of GI reactions
* Serious GI bleeding can occur in patients taking NSAIDs despite absence of symptoms
* Patients should be taught the signs and symptoms of GI bleeding (dark, „tarry„ stools, „coffee ground„ or bloody emesis) and instructed to notify the MD/PA immediately if they occur.

(vi) Common brand names
* Motrin
* Advil
* Nuprin

For cough, colds, and sinus allergies

(a) **Actifed**- Combination of two drugs-psuedoephedrine HCL (decongestant) 60 mg and Tripolidine HCL (antihistamine) 2.5 mg.

(i) Indications
* Colds
* Nasal congestion
* Seasonal allergy symptoms

(ii) Contraindications
* Patients with hypersensitivity to psuedoephedrine or tripolidine
* Should not be given to patients with hypertension, acute asthma, peptic ulcer disease, severe coronary artery disease, arrhythmias, glaucoma, angina pectoris, severe cardiovascular disease or patients taking MAO (monoamine oxidase) inhibitors.

(iii) Side effects
* Can cause drowsiness, dizziness, dry nose, mouth and throat
* May cause restlessness, anxiety, nervousness or insomnia in some patients
* Some patients may experience photosensitivity skin reactions during prolonged sun exposure.

(iv) Dosage-one tablet p.o. (by mouth) every 8 hours

(v) Considerations
* Should be taken with food or milk to reduce gastrointestinal distress
* Patient should avoid alcohol, driving and other activities that require alertness until the CNS effects are known by the patient
* Dry mouth can be relieved with gum, hard candy or ice chips
* Advise patients to use sunblock for possible photosensitivity.

(vi) Common brand name: Actifed

(b) Pseudoephedrine HCL (decongestant)

(i) Indications-Symptomatic relief of nasal congestion associated with rhinitis and sinusitis and for eustachian tube congestion

(ii) Contraindications
* Hypersensitivity to Sudafed
* Severe hypertension
* Coronary artery disease
* Glaucoma
* Hyperthyroidism or for patients taking MAO inh bitors.

(iii) Side effects
* Transient restlessness
* Stimulation
* Tachycardia
* Nervousness
* Dizziness
* Dry mouth.

(iv) Dosage
* 30 - 60 mg P.O. every 4-6 hours for adults

* Maximum daily dose (24 hours) is 240 mg.

(v) Considerations
* Drug may act as a stimulant
* Avoid taking within 2 hours of bedtime
* Advise patient to stop taking medication if extreme restlessness occurs and consult MD/PA
* Advise patients that many over the counter (OTC) drugs may contain ephedrine or other sympathomimetic amines and might intensify the action of psuedoephedrine if taken together.

(vi) Common brand name: Sudafed

(c) Chlorpheniramine -antihistamine

(i) Indications-Symptomatic relief of rhinitis and seasonal allergy symptoms

(ii) Contraindications
* Hypersensitivity to antihistamines
* Lower respiratory tract symptoms
* Narrow-angle glaucoma
* Severe hypertension
* Severe cardiovascular disease
* Bronchial asthma
* Patients taking MAO inhibitors.

(iii) Side effects-Low incidence of side effects
* Drowsiness
* Dizziness
* Dryness of mouth and nose

(iv) Dosage
* 8 mg P.O. every 8 hours (t.i.d.)
* Maximum daily (24 hours) dose is 24 mg.

(v) Considerations
* Drug may cause drowsiness
* Driving and other potentially hazardous activities should be avoided until the response to the drug is known
* Avoid alcohol use when taking this drug. Antihistamines have additive effects with alcohol.

(vi) Common brand name: Chlor-Trimeton, CTM

(d) Robitussin (guiafenesin)

(i) Indications
* Used to liquefy thick tenacious sputum
* Expectorant

(ii) Contraindications-Contraindicated in patients with known hypersensitivity to the drug

(iii) Side effects-rare
* GI upset

* Nausea
* Drowsiness

(iv) Dosage
* 200-400 mg P.O. every 4 hours
* Maximum daily (24 hours) dose is 2,400 mg.

(v) Considerations
* Take medication with plenty of fluids to help liquefy secretions
* Persistent cough may indicate a more serious problem. Notify MD/PA if cough lasts longer than one week

(vi) Common brand name: Hytuss, Robitussin, Humabid

(e) Robitussin DM (Guaifenesin with Dextromethorphan) Antitussive/Expectorant

(i) Indications-Temporary relief of cough spasms in nonproductive coughs due to colds and flu

(ii) Contraindications
* Hypersensitivity to the drug
* Patients who have asthma
* Persistent or chronic coughs or in patients taking MAO inh bitors.

(iii) Side effects-Rare
* Dizziness
* Drowsiness
* Excitability, especially in children
* GI upset
* Constipation and abdominal discomfort.

(iv) Dosage
* 10-20 mg P.O. every 4 hours or 30 mg P.O. every 6-8 hours.
* Maximum daily (24 hours) dose is 120 mg.

(v) Considerations
* Drug produces no analgesia or addiction and little or no CNS depression
* Dextromethorphan 15-30 mg is equivalent to 8-15 mg codeine as an antitussive
* Patient should understand that a persistent cough might indicate a more serious problems
* Coughs lasting for longer than a week should be evaluated by a MD/PA.

(vi) Common brand names
* Robitussin DM

(f) Diphenhydramine (antihistamine)

(i) Indications

* Temporary symptomatic relief of various allergic conditions and to treat or prevent motion sickness and vertigo
* Used in anaphylaxis as an adjunct to epinephrine
* Used as a sedative

(ii) Contraindications
* Contraindicated in patients who have a known hypersensitivity to the drug
* Do not give if patient has acute asthma or an enlarged prostrate gland

(iii) Side Effects
* Drowsiness
* Dry mouth
* Palpitations
* Some patients may experience nervousness, restlessness and insomnia.

(iv) Dosage
* 25 to 50 mg P.O. three times a day (t.i.d.) or four times a day (q.i.d.)
* Maximum daily dose (24 hours) is 300 mg.

(v) Considerations
* May cause GI upset
* Administer with food or milk
* Warn patients about possible additive CNS depressant effects with concurrent use of alcohol
* Patient should not engage in activities that require alertness and coordination until response to the drug is known
* Drowsiness is most prominent during the first few days of therapy and often disappears with continued therapy
* The drug has an atropine-like drying effect, which makes it a popular drug for use with the common cold
* Antihistamines have no therapeutic effects on the common cold and may make expectoration more difficult because it thickens bronchial secretions
* Increase fluid intake while taking this drug.

(vi) Common brand name: Benadryl

Emetics

(a) Syrup of Ipecac

(i) Indications-To induce vomiting in poisoning or overdose by ingestion in a conscious patient

(ii) Contraindications
* Stupor or coma
* Absent gag reflex

* Seizures
* Pregnancy
* Children under 6, or if the following is ingested: corrosives, hydrocarbons, strychnine or iodides

(iii) Side effects
* The risk of aspiration from vomiting is present.
* If the drug is not vomited, it may cause GI upset, diarrhea or slight CNS depression
* May cause persistent vomiting. Syrup of ipecac can be cardiotoxic if not vomited

(iv) Dosage - only given under orders of MD/PA
* Children 3-5 teaspoons, Adults 1-2 tablespoons P.O.
* Follow administration of the drug with 1-2 glasses of tepid water. Do not give milk products
* May repeat the dose in 20 minutes if no results

(v) Considerations
* Drug should be recovered by gastric lavage and activated charcoal if vomiting does not occur following the second dose
* Notify MD/PA immediately if vomiting does not occur. If poisoning has occurred, call a poison control center or emergency room or contact an MD/PA before using ipecac syrup
* Do not exceed the recommended dosage.

(vi) Common brand name: Syrup of Ipecac

Antidiarrheal

(a) Kaopectate Tabs
(i) Indications-Acute nonspecific diarrhea
(ii) Contraindications - Patients with known hypersensitivity to the drug and in patients with dysentery or suspected bowel obstruction
(iii) Side effects-constipation
(iv) Dosage
* 1.2 to 1.5 grams P.O. after each loose bowel movement
* Not to exceed 9 grams in 24 hours

(v) Considerations
* Use cautiously in patients with dehydration
* Encourage adequate fluid intake to compensate for fluid loss from diarrhea
* Do not use if diarrhea is accompanied by fever or blood or mucous in the stool.

(vi) Common brand names: Kaopectate, Donnagel

(b) Immodium
  (i) Indications-Acute nonspecific diarrhea
  (ii) Side effects-constipation
  (iii) Dosage
    * 2 - 2mg tabs, followed by 1 tab after each loose stool
    * Not to exceed 8 tablets a day
    * Do NOT give for bloody diarrhea

Antacids

(a) Calcium Carbonate Tabs
  (i) Indications
    * Used for relief of transient symptoms of hyperacidity as in acid indigestion and heartburn
    * Also used as a calcium supplement.
  (ii) Contraindications
    * Patients with hypercalcemia and hypercalciuria
    * Should also not be used in patients with calcium loss due to immobilization, severe renal disease, renal calculi, and GI hemorrhage or obstruction or cardiac disease.
  (iii) Side effects
    * Constipation or laxative effect
    * Acid rebound
    * Nausea
    * Flatulence.
  (iv) Dosage
    * 0.5-2 grams P.O. 4-6 times/day when used as an antacid
    * For use as calcium supplement 1-2 grams P.O. every 8 or every 12 hours
  (v) Considerations
    * When used as an antacid, take one hour after meals and at bedtime
    * Acid rebound, which generally occurs after repeated use of antacids for one or two weeks, can lead to chronic use
    * Caution patient not to use antacids for more than two weeks without medical supervision
  (vi) Common brand names: Tums, Caltrate, Os-Cal

Injectable medications

For pain
(a) Morphine (analgesic, narcotic (opiate) agonist)
  (i) Indications

* Symptomatic relief of severe acute pain after nonnarcotic analgesics has failed
* Also used to relieve pulmonary edema and the pain of myocardial infarction

(ii) Contraindications
* Patients with known hypersensitivity to the drug or to opiates
* Patients with increased intracranial pressure(head injuries), severe respiratory depression, acute bronchial asthma, convulsive disorders, chronic pulmonary diseases and undiagnosed acute abdominal conditions

(iii) Side effects
* Drowsiness
* Pruritus (itching)
* Respiratory depression
* Euphoria
* Disorientation
* Nausea
* Vomiting
* Constipation
* Occasionally patients will experience nervousness, restlessness, or insomnia
* Urinary retention may occur

(iv) Dosage
* 2.5-15 mg intravenous (IV) every 4 hours
* 1 –2 mg IV doses titrated to pain relief
* May also be given intramuscularly (IM) or P.O. (by mouth). IM dosage is 5-20 mg IM every 4 hours
* Oral dosage is 10-30 mg every 4 hours

(v) Considerations
* Monitor for respiratory depression
* Evaluate patient frequently for pain relief
* Patients who are ambulatory may experience nausea and orthostatic hypotension when moving from a supine to an upright position.
* Note: Morphine sulfate is a Schedule II Controlled Substance

(vi) Common brand name: Duramorph, MS Contin(oral)

For chemical agent poisoning

(a) Atropine INJ 0.7 ml

(i) Indications- used to treat a chemical agent poisoning

(ii) Contraindications-None when used for life threatening emergencies

(iii) Side effects

* Blurred vision
* Headache
* Pupillary dilatation
* Dry mouth
* Thirst
* Flushing of the skin
* Difficulty in urination

(iv) Dosage-0.5 to 1.0 mg

(b) Diazepam –Anticonvulsant (CANA)

(i) Indications
* Used to treat status epilepticus
* Used for short term relief of anxiety symptoms, to allay anxiety and tension prior to surgery, dental procedures and endoscopic procedures
* Used alleviate acute withdrawal symptoms of alcoholism

(vii) Contraindications
* Patients with known hypersensitivity to the drug
* Should not be given to patients in profound shock, coma, acute alcohol intoxication, or with depressed vital signs

(viii) Side effects
* Drowsiness and sedation
* Possible hypotension
* Depressed level of consciousness
* Some patients may become restless or agitated after administration of the drug.

(ix) Dosage
* For seizures/status epilepticus-5 to 10 mg IV (preferred), or IM if IV route not available
* May repeat every 10-15 minutes as needed up to a maximum of 30 mg
* For anxiety, the oral route is preferred and the dose is 2-10 mg P.O. anywhere from 2- 4 times a day depending on response.

(x) Considerations
* Don't mix diazepam with other drugs and don't store in plastic syringes
* IV route is the most reliable parenteral route
* IM administration is not recommended because absorption is variable and injection is painful
* Give IV not to exceed 5 mg a minute. Avoid the use of small veins, as this drug is very irritating and can cause phlebitis.

(xi) Common brand name: Valium

(c) Ativan (Lorazepam)
  (i) Indications
    * Anxiety disturbances or anxiety states: general anxiety disturbances panic disturbances phobic anxiety disturbances
    * Adjustment disturbances with anxiety or stress reaction
  (ii) Contraindications
    * Assess patient periodically
    * Safety and efficacy in children under the age of 12 has not been established
  (iii) Dosages
    * ADULT dose for anxiety is: 2mg - 3mg daily in 3 - 4 divided doses
    * RANGE: 1mg - 6mg daily in divided doses
    * ELDERLY/DEBILITATED PATIENTS: Initial dose of 1mg - 2mg/day in divided doses. Adjust as needed and tolerated.
    * In elderly and/or debilitated patients and in those with serious respiratory or cardiovascular disease, a reduction in dosage is recommended
    * In the case of local anaesthesia and diagnostic procedures requiring patient co-operation, concomitant use of an analgesic is recommended.
    * Ativan sl: Dosage of ativan sublingual should be individualized for maximum effect.
  (iv) Pre medication
    * The night before the procedure: The recommended dose is 1 - 2 mg
    * Pre-procedure: The recommended average adult dose is 2mg administered 1 - 2 hours before the procedure
    * If a heightened sedative effect is desired, a dose of 0.05mg/kg to a maximum of 4mg may be used

(d) 2-PAM Cl
  (i) Indications
    * Relieves the symptom of skeletal neuromuscular blockade
    * Simultaneous administration of atropine is required
  (ii) Contraindications
    * Can produce drowisness, headache, disturbance of vision, nausea, dizzziness, tachycardi and anincrase in blood pressure, hyperventilation and muscular weakness

For anaphylaxis

(a) Epinephrine 1:1000(1 mg/1cc) -bronchodilator

(i) Indications-Used for bronchospasm, hypersensitivity (allergic) reactions and anaphylaxis
(ii) Contraindications
* Patients with known hypersensitivity to the drug
* Patients with narrow-angle glaucoma, hemorrhagic, traumatic or cardiogenic shock, cardiac arrhythmias or coronary insufficiency.
(iii) Side effects
* Nervousness
* Restlessness
* Palpitations
* Tremors
* Fear
* Anxiety
* Headache
* Hypertension
* Nausea and vomiting
(iv) Dosage-0.1-0.5cc SC (subcutaneous) every 15 minutes as needed to treat acute symptoms
(v) Considerations
* Drug of choice for acute anaphylactic reactions
* Patients allergic to insect stings should be taught to self administer epinephrine
* Closely monitor vital signs after administration of the drug.
(vi) Common brand names: Adrenalin Chloride, Epi-Pen

Topical medications

(a) Bacitracin Ointment-Local Anti-infective
(i) Indications-Used topically in the treatment of superficial infections of the skin.
(ii) Contraindications
* Contraindicated in patients with known hypersensitivity to the drug
* Patients allergic to neomycin may also be allergic to bacitracin
(iii) Side effects
* Itching and burning have also been reported with topical use.
(iv) Dosage-Apply a thin layer of ointment twice a day or three times a day.
(v) Consideration
* Watch for signs of local allergic manifestations such as redness, itching and burning
* Clean skin before applying the drug

(vi) Common brand names: Bacitracin

(b) Hydrocortisone 1% cream-topical anti-inflammatory
- (i) Indications-For relief of inflammation and pruritus associated contact dermatitis
- (ii) Contraindications-Patients with known hypersensitivity to the drug or its components
- (iii) Side effects
  - * Maceration of the skin
  - * Secondary infection
- (iv) Dosage - Apply ointment to affected area sparingly daily to four times a day until acute phase is controlled, then reduce dosage to one to three times weekly, as needed.
- (v) Considerations
  - * Gently wash skin before applying ointment
  - * Avoid applying near eyes or mucous membranes
  - * May be safely used on the face, groin, armpits and under breasts.
- (vi) Common brand names
  - * Cortizone-5
  - * Bactine Hydrocortisone
  - * Acticort 100

(c) Miconozole 2% cream-anti-fungal
- (i) Indications-Used to treat tinea pedis (athlete's foot), tinea cruris and tinea corporis
- (ii) Contraindications-Contraindicated in patients with known hypersensitivity to the drug.
- (iii) Side effects
  - * Skin irritation
  - * Burning
  - * Maceration
  - * Allergic contact dermatitis.
- (iv) Dosage-Apply sparingly twice a day to the affected area for 2-4 weeks.
- (v) Considerations
  - * Instruct patient how to cleanse area prior to application of cream
  - * Apply sparingly in skin-fold areas and massage in well to prevent maceration.
- (vi) Common brand names: Micatin

(d) Clortrimozole Cream- Anti-fungal
- (i) Indications-Used to treat dermal fungal infections, tinea pedis, tinea cruris and tinea corporis
- (ii) Contraindications-Patients with known hypersensitivity to the drug or its components
- (iii) Side effects

* Stinging
* Erythema
* Edema vesication
* Pruritis and urticaria

(iv) Dosage-Apply small amount to affected area twice a day, A.M. and P.M., or as directed by the physician.

(v) Considerations
* Apply to dry skin
* Cleanse skin thoroughly before applying the medication
* Signs of clinical improvement should be anticipated within one week of use. Report signs of condition worsening, skin irritation or no improvement after 4 weeks of therapy

(vi) Common brand names: Lotrimin, Mycelex

(e) Dibucaine Ointment-local anesthetic

(i) Indications-Used for temporary relief of pain and itching due to hemorrhoids and other anorectal disorders, nonpoisonous insect bites, sunburn, minor burns, cuts and scratches.

(ii) Contraindications-Patients with known hypersensitivity to the drug or its components.

(iii) Side effects
* Skin irritation
* Contact dermatitis
* Rectal bleeding (suppository use)

(iv) Dosage
* Apply skin cream or ointment to affected areas, as needed (max 1 oz in 24 hours)
* Insert rectal ointment morning and evening and after each bowel movement.

(v) Considerations
* The cream preparation is water soluble and therefore should be applied after bathing or swimming
* Caution patient to use medication only as directed
* Medication is intended only for temporary relief of mild to moderate itching or pain

(vi) Common brand names: Nupercainal

Antibiotics

Penicillin

(a) Indications

(i) Penicillin administered intravenously is a primary drug of choice for bacterial meningitis if this disease is caused by sensitive strains of

meningococci or pneumococci. Further important indications for an intravenous penicillin treatment are an endocarditis caused by streptococcus viridans, other streptococcal infections (severe pneumonia, arthiritis), neurosyphilis, actinomycosis, anthrax, and clostridium infections.

(ii) Smaller doses are administered intramuscularly. A streptococcal pharyngitis can be treated with a single injection of a benzylpenicillin slow release preparation (if available). Erysipelas, diphtheria, pneumococcal pneumonia, and primary syphilis infections can also be treated intramuscularly. Secondary prophylaxis of rheumatic fever has become very rare.

(iii) Orally administered Penicillin VK is a "painless" alternative for streptoccal infections. It can be considered in the early stages of Lyme disease if doxycycline is contraindicated.

(b) Contraindications: None except hypersensitivity to penicillin

(c) Cautions: If a meningococcal infection is suspected, parenteral penicillin therapy ought to be started as quickly as possible.

(d) Adverse Reactions

(i) Severe penicillin hypersensitivity with anaphylactic shock is very rare and occurs mostly in connexion with parenteral administration (5 to 10 cases on 10000 treated subjects). The emergency treatment is based primarily on epinephrine (and, in addition, maybe intravenous corticosteroids).

(ii) Hypersensitive skin reactions (skin rashes, urticaria) are frequent (1 to 7% of the treated subjects). A sterile abscess can occur at the area of the i.m. injection. Hemolytic anemia, nephritis, and liver granuloma are very rare complications. Massive i.v. doses are associated to a risk of an electrolyte and volume overload.

(iii) Oral preparations occasionally cause nausea, vomiting, or diarrhea.

(e) Risk groups

(i) Pregnant women: Can be given. Penicillin is considered the safest antibiotic during pregnancy.

(ii) Nursing mothers: Can be given. Concentrations in breast milk are relatively low. The risk of an alteration of the child's intestinal flora or of a hypersensitivation cannot be excluded.

(iii) Children: Intravenously for severe infections: 0.2 to 0.5 million I.U./kg/day in 4 to 6 doses. Oral (penicillin V): 100,000 I.U./kg/day in two doses (a maximum of 1.5 million I.U./day).

(iv) Elderly people: No dose reduction is necessary if renal functions are normal.
(v) Renal failure: Creatinine clearance less than 50 ml/min: reduce dose by 25 to 50%; clearance less than 10 ml/min: reduce dose by 50-75%.
(vi) Liver insufficiency: No dose adjustment necessary

Doxycycline (Oral)

(a) Indications
  (i) Doxycycline is effective for selected infections of the upper respiratory tract or of the (genito-) urinary tract
  (ii) Particularly well suited for atypical pneumonia (as long as a legionella infection can be excluded), for disease following chlamydia trachomatis (non-gonorrheal urethritis, acute urethral syndrome, venereal lymphogranuloma, etc.), for rickettsial diseases (Rocky Mountatin spotted fever, Q fever), for cholera, and for anthrax. Doxycycline can be applied in stage I of Lyme disease. The efficacy for papulopustular acne is also well documented.
  (iii) Doxycycline is considered an alternative drug for syphilis when there is e.g. a hypersensitivity to penicillin.
  (iv) Recommended as a follow-up treatment to a single dose of ceftriaxone for the treatment of possible chlamydia infections in context with gonorrhea
  (v) Used in combination with other ant biotics for acute adnexites caused by mixed infections
  (vi) Used for the prophylaxis of traveler's diarrhea
  (vii) Also considered for the prevention or treatment of multiresistant malaria (e.g. in Thailand)
(b) Contraindications
  (i) Pregnant women: Disturbances in the development of the teeth and bones of the fetus. Can be hepatotoxic for the mother in isolated cases.
  (ii) Nursing mothers: Most specialists allow breast-feeding: it appears only in small amounts in breast milk; risks for child and mother are probably minimal.
  (iii) Children: Contraindicated before the age of eight! (Staining of the teeth and possibly disturbed bone growth.) Older children: 2 to 4 mg/kg/day, may be divided into two doses.
  (iv) Renal failure: Some authors recommend a dose reduction when there is severe insufficiency
(c) Adverse Reactions

(i) Approximately 3 to 4% of the treated subjects complain about nausea
(ii) Abdominal pains and diarrhea are less common
(iii) Esophageal ulcerations have been observed after the administration of doxycycline capsules (do not take before retiring to bed!)
(iv) Like other tetracyclines, doxycycline can lead to staining of the teeth and bone problems in the developing age. Allergic skin reactions occur in about 2%
(v) Doxycycline can cause a cutaneous photosensitivity - inform patient increase risk of sunburn, sensitive to sun and to wear sunscreen

(d) Interactions
(i) Concomitant administration of antacids, calcium-, magnesium-, and iron-salts has a chelating effect and therefore causes a reduced absorption of the ant biotic
(e) Caution: Doxycycline can also be injected intravenously

Cefazolin (Injection)

(a) Indications
(i) Respiratory infections caused by S.pneumoniae, Klebsiella, H.influenzae S.aureus, group A beta-haemolytic streptococci
(ii) Genito-urinary infections caused by E.coli, P.mirabilis, Klebsiella, some strains of enterococci and Enterobacter
(iii) Skin and soft tissue infections due to S.aureus, and group A beta- haemolytic streptococci and other strains of streptococci
(iv) Biliary tract infections due to E.coli and Klebsiella species
(v) Bone and joint infections due to S.aureus.
(vi) Septicaemia due to S.pneumoniae, S.aureus, P.mirabilis, E.coli and Klebsiella species
(vii) Endocarditis due to S.aureus and group A beta-haemolytic streptococci. Appropriate culture and suscept bility studies should be performed to determine susceptibility of the causative organism to cefazolin.
(viii) Peri-operative prophylaxis: Cefazolin is useful in pre-operative, intra-operative and post-operative prophylaxis in various surgical procedures.This is especially effective in reducing the post-operative infections due to contaminated or potentially contaminated surgical procedures. The preoperative use of cefazolin may also be effective in surgical patients in whom infection at the operative site would present a serious risk. The prophylactic administration of cefazolin should

usually be discontinued within a 24-hour period after surgical procedure. NOTE: Susceptibility studies should be performed.

(ix) Bacteriology

* Staphylococcus Aureus (penicillin sensitive and resistant)
* Group A beta-haemolytic streptococci and other strains of streptococci (many strains of enterococci are resistant)
* Escherichia coli
* Proteus mirabilis
* Klebsiella species
* Enterobacter aerogenes
* Haemophilus influenzae

(b) Contra-Indications

(i) Cross sensitivity to Penicillin. About 10% of people allergic to penicillin will also be allergic to Cefozolin

(ii) Hypersensitivity to cephalosporins

(iii) Safety in pregnancy, lactation and infants under one month of age has not been established and as such is not recommended

(c) Dosage: Management of overdose

(i) Rx: Symptomatic and supportive

(d) Side-Effects

(i) Drug fever
(ii) Skin rash
(iii) Vulvar pruritis
(iv) Nausea
(v) Vomiting
(vi) Anorexia
(vii) Diarrhea
(ix) Genital and anal pruritis
(x) Genital moniliasis and vaginitis
(xi) Phlebitis at the site of injection and after I/M administration, pain at site of injection

(e) Precautions:

(i) Allergic reaction warrants immediate withdrawal of the drug with appropriate treatment.

(ii) Caution in patients with penicillin sensitivities as cross sensitivity has been noted.

(iii) Prolonged use may cause overgrowth of non-suscept ble organisms.

(iv) Caution in patients with low urinary output because of impaired renal function. A lower daily dose is required.

(v) Pseudomembranous colitis has been reported with broad spectrum antibiotics including cefazolin, therefore it is important to consider it's diagnosis in patients who develop diarrhea in association with

it's use. Such colitis may be life threatening and appropriate measure should be taken, including discontinuation of the anti-biotic

(vi) Pregnancy:

* Safety in pregnancy, lactation, premature infants and infants under one month has not been established.
* Many cephalosporins have been used in pregnancy without any apparent ill effect to the mother or fetus.

(f) Brand Name

(i) Ancef®

(ii) Kefzol

91W10
Advanced Individual Training Course

Clinical Handbook
Supportive Care 4

Department of the Army
Academy of Health Sciences
Fort Sam Houston, Texas 78234

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Appendix A – Wound Care, Competency Skill Sheets

Appendix B - Cardiac Monitoring, Competency Skill Sheets

Appendix C –Respiratory Care, Competency Skill Sheets

TERMINAL LEARNING OBJECTIVE
Given a deceased casualty provide post-mortem care.

Process Used to Declare a Person Dead

Hospital policies state who is responsible for pronouncing the death of the patient. The physician is the best qualified and is usually respons ble for declaring a person dead.

Changes That Occur in the Body after Death

Post-mortem Cooling (Algor Mortis)

(1) Occurs when no further heat is produced by metabolism. Body temperature falls gradually after death (approximately 1.0 to 1.5 degrees F/hr.)
(2) Cooling continues until room temperature is reached in about 24 hours

Muscular Rigidity (Rigor Mortis)

(1) Begins about 6 hours after death
(2) First evident in the muscles of the jaw, then extends to involve all the muscles in the body 12 to 14 hours after death
(3) Condition where the muscles become rigid. The body is fixed in the position in which it lies.

Purple Discoloration (Livor Mortis)

(1) Reddish-purple discoloration that develops in the dependent parts of a dead body
(2) First evident about 30 minutes after death and fully developed in 6-10 hours
(3) Discoloration is caused by blood flowing passively into the dependent parts of the body

Decomposition (Putrefaction)

(1) The destruction of a dead body by bacteria
(2) The rate at which changes develop depends on the environment. Hot, moist conditions favor putrefaction, but cold, dry air delays or prevent it.
(3) The body of the deceased should be placed in refrigeration in the morgue as soon as possible
(4) It is best not to keep the body on the nursing unit more than one hour
(5) Embalming is used as a method of chemically preserving the body. A solution is introduced into the body that kills the bacteria and prevents the rapid decomposition of tissues.

Death Certificate

U.S. laws require that a death certificate be prepared for each person who dies.

Death certificates are sent to local health departments, which compile statistics from the information

A physician is usually responsible for declaring a person dead and is required to sign the death certificate

Organ Donation and Autopsy

Patients who express a wish to donate functional organs after death should be provided an organ donor consent card

The family of a deceased client may decide to donate the client's organs and should also be provided with information and consent forms

An autopsy is an examination of the organs and tissue of a human body after death

The closest surviving family member usually has the authority to consent for an autopsy

(1) It is usually the physician's responsibility to obtain permission for an autopsy
(2) The client may have granted permission before his death
(3) If the death was caused by accident, suicide, homicide, or illegal therapeutic practice, the coroner must be notified and he will decide if an autopsy is necessary
(4) The family's consent is not needed in these cases
(5) Many relatives find comfort when they are told that the knowledge gained from an autopsy may contribute to advancements in medical science as well as establish the exact cause of death

Responsibility in Preparing the Body

a. Provide privacy for the patient and/or family
b. Verify that the patient has died, and has been pronounced dead by the physician
c. Notify appropriate persons in the hospital, as well as the clergy, if requested by the family
d. Obtain the death pack
e. Wear gloves when preparing the body
f. Position the body supine in proper alignment, close the eyelids, and place a pillow under the head. If the eyes are to be donated, place a small ice pack on each eye.
g. Change all dressings; if appropriate, remove jewelry and eyeglasses and place with personal belongings, and replace dentures, if possible
h. Bathe the body
   (1) Using plain water, wash the areas of the body that may be soiled with blood, feces, or emesis
   (2) If drainage occurs around the rectum, urethra or vagina, place a gauze 4 X 4 over each opening and secure it with tape to prevent further soiling
i. Arrange the hair neatly
j. Care of drainage and other tubes
   (1) If there is to be an autopsy, the tubes are generally left in the body
   (2) Remove the drainage bottles or bags from the tubes and fold the tubes over twice; secure each with a rubber band to avoid leakage

(3) Make sure you deflate the balloon tips so as not to injure the body tissues upon removal

k. Apply a clean patient gown and clean bed linen if the family will be viewing the body; leave the head uncovered and have the room arranged neatly

l. Prepare the family before viewing the body: offer support and your physical presence if desired, during their visit, and assist them with funeral arrangements, if necessary

m. Identify and assemble the patient's personal belongings for the family; complete a full inventory of the patient's belongings

n. Attach 3 forms of identification. Two tags are placed on the body (usually the great toe and the wrist). A third tag is placed on the shroud or zippered bag.

o. You may need to tie a bandage lightly under the jaw and up around the head to keep the jaw closed

p. Lightly bandage the wrists together, criss- crossed over the abdomen to prevent the arms from falling off the stretcher when the body is being moved to the morgue

q. Place the body within the shroud or zippered bag

r. Transport the body to the morgue
   (1) Place the body on a stretcher and secure it with straps

s. Record the procedure before the body leaves the nursing unit
   (1) Record the time and date body was taken to the morgue or by the undertaker
   (2) If valuables were placed in safekeeping, indicate this in writing
   (3) If valuables were given to the family or friends, record name of the person(s) to whom they were given, their relationship to the deceased, and the time and date
   (4) Have a co-worker who witnessed this action co-sign with you in the notes

Role in Caring for the Family of the Deceased Client

After death, the soldier medic must continue to provide care for the family of the deceased client

(1) Listen to the family's expression of grief and loss
(2) Allow family members to see the client's body. This will help them to accept the death fully.
(3) Provide a private place for the family to grieve and make necessary arrangements
(4) Contact the chaplain if the family requests

Deaths on the Battlefield

- On the battlefield when KIA's are identified a spot report is generated identifying the location of the remains so that when the battle is over the remains can be recovered and turned over to mortuary affairs.

- It is standard to use a 10 digit grid coordinate
  (1) 10 Digit Grid coordinate will identify a 1 square meter location within a grid square for the location of the body
  (2) A global positioning system (GPS) can also be used to document the location of a body

TERMINAL LEARNING OBJECTIVE
Given a standard fully stocked Combat Medic Vest System (CMVS) or fully stocked M5 Bag, you encounter a casualty with an open wound who is breathing. The casualty has been initially assessed and injury(ies) prioritized.

Closed wound injury
- (1) Contusion - Hematoma beneath unbroken skin because of small vessel ruptures
- (2) Crush injuries - Overlying skin may remain intact, injury to multiple tissues, muscle or bone injury

Open wound injury
- (1) Abrasions - Partial thickness skin loss
- (2) Lacerations - Break in skin of varying depth
- (3) Avulsion - Full thickness skin loss, degloving or flap injuries are avulsions
- (4) Amputations - A part of the body is partially or completely severed or torn from the body
- (5) Punctures/ penetrations - Caused by a foreign object that enters the body, underlying damage can be extensive
- (6) Bite - Breakage of the skin caused by animal or human teeth, all bites are considered contaminated

Identify forms of wound healing
Three types of wound healing
- (1) Primary intention (primary union)
  - (a) Wounds that are made surgically
  - (b) Little tissue loss
  - (c) Skin edges are close together and minimal scarring
  - (d) Healing begins during the inflammatory phase
- (2) Secondary intention (granulation)
  - (a) Healing occurs when skin edges are not close together (approximated) or when pus has formed
  - (b) If wound is producing or containing pus (purulent) a drainage system is established or the wound is packed with gauze
  - (c) Slowly the necrotized tissue decomposes and escapes
  - (d) The cavity begins to fill with soft, pink, fleshy projections consisting of capillaries surrounded by fibrous collagen (granulation tissue)
  - (e) The amount of granulation tissue required depends on the size of the wound
  - (f) Scarring is greater in a large wound
- (3) Tertiary (third) intention
  - (a) Delayed primary closer
  - (b) Two layers of granulation tissue are sutured together
  - (c) Occurs when:
    - (i) Contaminated wound is left open and sutured closed after the infection is controlled
    - (ii) Delayed suturing of a wound

(iii) Primary wound becomes infected, is opened, is allowed to granulate, and is then sutured
(d) Results in a larger and deeper scar than primary or secondary intention

Factors promoting wound healing

(1) Adequate oxygenation
(2) Adequate rest or local immobilization
(3) Sufficient blood supply
(4) Proper nutrition
(a) Nutrients are needed for wound repair and prevention of infection
(b) Adequate wound healing is dependent upon the availability of essential nutrients

Factors that impair wound healing

(1) Age - causes slower regeneration of tissue
(a) Physiological Effects
(i) Alters all phases of wound healing
(ii) Vascular changes impair circulation to wound site
(iii) Reduced liver function alters synthesis of clotting factors
(iv) Formation of antibodies and lymphocytes is reduced
(v) Collagen tissue is less pliable
(vi) Scar tissue is less elastic
(b) Interventions
(i) Instruct patient on safety precautions to avoid injuries
(ii) Be prepared to provide wound care for longer period
(iii) Teach home caregivers wound care techniques

(2) Malnutrition
(a) Physiological Effects
(i) All phases of wound healing are impaired
(ii) Stress from burns or severe trauma increases nutritional requirements
(b) Interventions
(i) Provide balanced diet rich in protein, carbohydrates, lipids, vitamins A and C, and minerals

(3) Obesity
(a) Physiological Effects
(i) Fatty tissue lacks adequate blood supply to resist bacterial infection and deliver nutrients and cellular elements
(b) Interventions

(i) Observe obese patient for signs of wound infection, dehiscence, and evisceration

(4) Impaired oxygenation
- (a) Physiological Effects
  - (i) Low arterial oxygen tension alters synthesis of collagen and formation of epithelial cells
  - (ii) If local circulating blood flow is poor, tissues fail to receive needed oxygen
  - (iii) Decreased hemoglobin (anemia) reduces arterial oxygen levels in capillaries and interferes with tissue repair
- (b) Interventions
  - (i) Diet adequate in iron
  - (ii) Monitor patients' hematocrit and hemoglobin levels

(5) Smoking
- (a) Physiological Effects
  - (i) Reduces the amount of functional hemoglobin in blood, thus decreasing tissue oxygenation
  - (ii) May increase platelet aggregation and cause hypercoagulability
  - (iii) Interferes with normal cellular mechanisms that promote release of oxygen to tissue
- (b) Interventions
  - (i) Discourage patient from smoking by explaining its effects on wound healing

(6) Presence of infection

(7) Drugs
- (a) Physiological Effects
  - (i) Steroids reduce inflammatory response
  - (ii) Anti-inflammatory drugs suppress protein synthesis, wound contraction, epithelialization, and inflammation
  - (iii) Prolonged antibiotic use may increase risk of superinfection
  - (iv) Chemotherapeutic drugs can depress bone marrow function, number of leukocytes, and inflammatory response
- (b) Interventions
  - (i) Carefully observe patient; signs of inflammation may not be obvious

(8) Chronic diseases that interfere with oxygenation and transport of nutrients
- (a) Physiological Effects

(i) Chronic disease causes small blood vessel disease that impairs tissue perfusion
(ii) Diabetes causes hemoglobin to have greater affinity for oxygen, so it fails to release oxygen to tissues
(iii) Hyperglycemia alters ability of leukocytes to perform phagocytosis and also supports overgrowth of fungal and yeast infection

(b) Interventions
(i) Instruct patient to take preventive measures to avoid cuts or breaks in skin
(ii) Provide preventive foot care
(iii) Control blood sugar to reduce the physiological changes associated with diabetes

Assessment considerations

Obtain history of wound injury

(1) How did the wound occur?
(2) What type of object caused the injury?
(3) When did the wound occur?
(4) Color
(a) Pink - usually indicates healthy tissue
(b) Black - indicates poor tissue perfusion, necrosis
(c) Red - indicates infection
(5) Odor - a foul smell indicates presence of bacteria
(6) Wound size –
(a) Measure wound from side to side at largest point
(b) Take second measurement perpendicular to first
(c) Document both measurement (i.e., "1" by "3"), or by using commonly-known object, such as "dime-sized" wound
(7) Wound boundaries - edges of wound smooth or irregular
(8) Drainage
(a) Color
(b) Quantity
(c) Consistency (watery, thick, etc.)
(d) Odor

Neurovascular status of the affected extremity MUST be assessed prior to wound treatment

(1) Pulse quality, location, rate
(2) Capillary refill
(3) Skin color/temperature
(4) Sensation/Motor function

Assess the wound

(1) Contusion
(a) Assess for depth of hematoma
(b) Identify damage to underlying vessels, nerves and bony structures

(c) Assess peripheral pulses
(d) Assess sensation
(e) Assess motor function and strength
(f) Assess for pain control
(g) Assess tetanus prophylaxis status

(2) Crush injury
(a) Assess for wound depth and blood loss
(b) Assess for neurovascular status:
(i) Pulse quality, location, rate
(ii) Capillary refill
(iii) Skin color
(iv) Level of consciousness
(c) Assess for pain control
(d) Assess tetanus prophylaxis status

(3) Abrasion
(a) Assess for amount of fluid loss in large wounds
(b) Assess functional capabilities
(c) Assess for pain control
(d) Assess tetanus prophylaxis status

(4) Laceration
(a) Assess age and depth
(b) Assess degree and/or type of contamination
(c) Assess for associated injuries
(d) Assess neurovascular status of affected extremity as appropriate:
(i) Pulse quality, location, rate
(ii) Capillary refill
(iii) Skin color/temperature
(iv) Sensation/motor function
(e) Assess for pain control
(f) Assess tetanus prophylaxis status

(5) Avulsion
(a) Assess amount of tissue and functional loss
(b) Assess depth of injury
(c) Assess for pain control
(d) Assess for tetanus prophylaxis status

(6) Amputations
(a) Assess for blood loss and bleeding source
(b) Assess neurovascular status:
(i) Pulse quality, location, rate
(ii) Capillary refill
(iii) Skin color/temperature
(iv) Sensation/motor function
(c) Assess for pain control
(d) Assess for tetanus prophylaxis status

(7) Punctures/ penetrations
(a) Assess for presence of foreign bodies/materials and impaled objects
(b) Assess depth of penetration for underlying structural damage

(c) Assess type/degree of contamination
(d) Assess for pain control
(e) Assess for tetanus prophylaxis status

Emergency treatment of specific wound types

General treatment

(1) Life-threatening injuries are managed prior to isolated wounds: Assess for and treat any existing critical injuries
  (a) Airway
  (b) Breathing
  (c) Circulation
(2) Wound categories
  (a) Penetrating chest wounds
  (b) Impaled or open abdominal wounds
  (c) Amputations
  (4) Avulsions
  (5) Crush injury
(3) Expose area
(4) Stop the bleeding
(5) Maintain intravenous access and fluids for significant blood loss or severe underlying structure damage: Treat for shock as necessary
(6) Assess for neurovascular status:
  (a) Pulse quality, location, rate
  (b) Capillary refill
  (c) Skin color/temperature
  (d) Sensation/motor function
(7) Emergency treatment of specific wounds
  (a) Cleanse wound to decrease contamination
  (b) Prevent dehydration of wound by covering wound with sterile dressing
(8) Assess and apply appropriate type of dressing and splints
(9) Assess activity restrictions
(10) Provide pain relief management
  (a) Apply ice packs
  (b) Administer medication

Specific treatment

(1) Contusion
  (a) Elevate contused area or extremity
  (b) Apply ice pack within first 24 hrs
(2) Crush injury
  (a) Control bleeding
    (i) Direct pressure
    (ii) Pressure dressing
  (b) Apply dry, sterile dressing
  (c) Elevate extremity, if possible
  (d) Administer antibiotics as directed and tetanus
(3) Abrasion

(a) Cleanse wounds thoroughly by scrubbing with normal saline
(b) Remove debris and foreign bodies with soaked sponge or irrigation
(c) Apply ant biotic ointment
(d) Leave wound uncovered or covered with a nonadherent dressing

(4) Laceration
(a) Control bleeding with direct pressure
(b) Cleanse and irrigate thoroughly
(c) Wound closure by skin sutures, staples or steri-strips
(i) Sutures - thread, wire or other materials used to sew body tissues together
* Placed within tissue layers in deep wounds and superficially as the final means for wound closure
* Deeper sutures are usually made of material that will be absorbed by the body in several days
* Types: Interrupted or separate, continuous, blanket, retention suture covered with rubber tubing to provide greater strength
(i) Staples
* Provides quick closure
* Usually less costly
* Limited to areas of less cosmetic importance such as scalp or trunk
* Removal of staples requires a sterile staple extractor and maintenance of aseptic technique

(5) Avulsion
(a) Control bleeding by direct pressure
(b) Cleanse thoroughly
(c) Cover wound with ointment, sterile dressing, and splints

(6) Amputations
(a) Control bleeding with direct pressure, pressure points and elevation
(i) Apply tourniquet if above measures are not successful
(b) Apply moist, sterile dressing over amputation stump
(c) Wrap amputated body part in moist, sterile dressing; place in plastic bag and place over ice

(7) Punctures/ penetrations
(a) Secure any impaled objects
(b) Soak the wound in warm solution for several minutes
(c) Provide care of drains, if present
(d) Administer antibiotics as directed and tetanus

Care for a wound

Types of dressing

(1) Gauze dressing
- (a) Permit air to reach the wound
- (b) Sterile dressings

(2) Semiocclusive dressing
- (a) Permit oxygen but not air to pass
- (b) Thought to promote healing by keeping wounds moist (yet sterile) so epithelial cells can slide more easily over the surface of the wound

(3) Occlusive dressing
- (a) Permit neither oxygen or air to pass
- (b) Thought to promote healing by keeping wounds moist (yet sterile) so epithelial cells can slide more easily over the surface of the wound
- (c) Tape strips are placed on all sides of the dressing

Changing of dressing

(1) Dressings are changed per doctor's orders, when the wound requires assessment or care, and when they become loose or saturated with drainage

(2) Supplies and equipment needed
- (a) Waterproof bed pads
- (b) Sterile dressings
- (c) Plastic bag or basin
- (d) Sterile saline or water
- (e) Irrigation pack and solution
- (f) Eye shield or face guard
- (g) Sterile and clean gloves
- (h) Tape or Montgomery straps

(3) Explain procedure to patient
- (a) Gather supplies and wash hands
- (b) Position the patient and expose the area to be redressed
- (c) Place waterproof pad under patient and prepare plastic bag as receptacle
- (d) Put on clean non-sterile exam gloves
- (e) Gently loosen tape toward the wound while supporting the skin around the wound or untie Montgomery straps
- (f) Remove the dressing, being careful not to tear the wound or dislodge any drains. Use sterile saline to moisten dressing if it is sticking to the wound, to prevent discomfort to the patient and/or to maintain integrity of sutures.
- (g) Assess amount, color, odor, and consistency of drainage
- (h) Remove gloves and dispose in plastic bag
- (i) Establish a sterile field. Open all sterile equipment and supplies and place within the sterile field. Uncap sterile saline or other solution as ordered
- (j) Put on sterile gloves

Cleansing the wound

(1) Linear wound
- (a) First stroke - cleanse the area directly over the wound by wiping from the top to bottom. Discard the gauze.
- (b) Second stroke - cleanse the skin area on one side next to the wound, wiping from top to bottom. Discard the gauze.
- (c) Third stroke - cleanse the skin on other side of wound, wiping from top to bottom. Discard the gauze.
- (d) Continue this procedure alternating sides of the wound, working away from the wound until clean.

(2) Circular wound
- (a) First stroke - starting at the center of the wound, wipe the wound area with an outward spiral motion. Do not use the same swab/gauze to clean the entire wound
- (b) Continue this procedure, working outward until wound is clean. Do not cross back to the center of wound.

Irrigate the wound

(1) Put on sterile gloves and eye shield or face guard, if available
(2) To prevent contamination and to clean the bottle rim, pour a small amount of the liquid into waste receptacle. If the seal of the bottle has not been broken, this step is not necessary
(3) Pour irrigating solution into basin with the label facing the palm
(4) Fill the syringe with solution from the sterile basin

CAUTION: If Betadine (iodine) is being used, check to ensure patient does not have allergies to the iodine. An alternate, non-iodine-based solution may be used (H biclens, phisohex, hydrogen peroxide).

(5) Hold the tip of the syringe just above top end of wound and force fluid into the wound slowly and continuously. Use enough force to flush out debris but do not squirt or splash fluid
(6) Irrigate all portions of the wound. DO NOT force solution into wound pockets. Continue irrigating until solution draining from bottom end of wound is clear
(7) Using sterile gauze, gently pat dry the edges of the wound. Work from cleanest to most contaminated areas

Apply a sterile dressing

(1) Lay inner dressing over wound ensuring the dressing extends past the edge of the wound
(2) All other dressings will overlap each other and cover entire wound
(3) Cover all inner dressings with a large out dressing

CAUTION: Some wounds must be kept moist, and will require the use of "wet to dry" dressings. The inner dressings that touch the wound directly will be dampened with a solution (usually normal saline) before application. The outer dressings are applied dry. Example: abdominal evisceration.

WARNING: During combat conditions, the medic will NOT remove an existing dressing but will only reinforce with additional dressings. Label the dressing "REINFORCED." Write date, time and your initials.

(4) Remove gloves and place in disposal bag
(5) Tape the dressing or tie Montgomery straps

CAUTION: Tape should not form a constricting band around the wound or extremity.

(6) Reposition and cover patient
(7) Close and dispose of plastic bag with used supplies IAW local policy
(8) Wash hands
(9) Document wound care and all assessments on the appropriate form
  (a) Enter the date and time of the procedure
  (b) Enter a description of the wound's color, odor, consistency, and amount of drainage

Drainage and drainage systems

Wound drainage

(1) Exudate –fluid, cells or other substances that have slowly exuded or discharged from cells or blood vessels through small pores or breaks in cell membrane
(2) Drainage – the removal of fluids from a body cavity, wound, or other source of discharge by one or more methods
(3) Types
  (a) Serous
    (i) Clear, watery fluid that has been separated from its solid elements (e.g., the exudate from a blister)
    (ii) Serous fluid has characteristics of serum
    (iii) Serum is clear, thin, sticky fluid portion of blood that remains after coagulation
  (b) Sanguineous
    (i) Fluid contains blood
  (c) Serosanguineous
    (i) Thin and red, described as pink
(4) Exudate/drainage greater than 300 ml in the first 24 hours should be treated as abnormal
(5) When patients first ambulate, a slight increase may occur
(6) If sanguineous drainage continues, small blood vessels may be oozing
(7) Not all surgical wounds drain, the following characteristics are important to note and chart:
  (a) Color
  (b) Amount
  (c) Consistency (thick/thin)
  (d) Odor

Wound drainage systems

(1) Open drainage
  (a) Drainage that passes through an open-ended tube into a receptacle or out onto the dressing

(b) Penrose drain is a soft tube that may be „advanced“ or pulled out in stages as the wound heals from the inside out

(2) Closed / Suction drainage
- (a) Self-contained suction units that connects to drainage tubes within the wound
- (b) Removes fluid in an airtight circuit
- (c) Prevents environmental contaminates from entering the wound or cavity
- (d) Two types of drainage devices that are portable and provide constant low-pressure suction to remove and collect drainage without wall suction
  - (i) Jackson-Pratt drain – used when small amounts (100 –200 ml) of drainage is anticipated
  - (ii) Hemovac drainage system used for larger amounts (up to 500 ml) of drainage

Assist with on-going casualty management

Evaluation of wound healing

(1) Checked after:
- (a) Each dressing change
- (b) Application of heat and cold therapies
- (c) Wound irrigation
- (d) Stress to the wound site

(2) Evaluation measures
- (a) Assess condition of the wound
- (b) Ask whether patient notes any discomfort during procedure
- (c) Inspect condition of dressings at least every shift

(3) Documentation: minimal characteristics in every wound evaluation
- (a) Location
- (b) Size
- (c) Drainage color
- (d) Amount
- (e) Consistency (thick/thin)
- (f) Odor
- (g) NV Status

Continuing Assessment

(1) Monitor vital signs
(2) Monitor distal peripheral pulses
(3) Monitor skin color, sensation and temperature
(4) Monitor motor function
(5) Monitor IV fluids
(6) Provide pain control
(7) Monitor for compartment syndrome
- (a) Pain
- (b) Firmness of muscle compartment

(c) Paresthesia
(8) Evacuate to next echelon of care for further medical treatment as indicated

Wound complications

(1) Impaired wound healing
  (a) Accurate observation
  (b) Ongoing interventions

(2) Terms associated with wound complications
  (a) Abscess – Cavity containing pus and surrounded by inflamed tissue, formed as a result of suppuration in a localized infection
  (b) Adhesion – Band of scar tissue that binds together two anatomical surface normally separated; most commonly found in the abdomen
  (c) Cellulitis – Infection of the skin characterized by heat, pain, erythema, and edema
  (d) Dehiscence – Separation of a surgical incision or rupture of a wound closure
  (e) Evisceration – Protrusion of an internal organ through a wound or surgical incision
  (f) Extravasation – Passage or escape into the tissues; usually of blood, serum, or lymph
  (g) Hematoma – Collection of extravasate blood trapped in the tissues or in an organ resulting from incomplete hemostasis after surgery

(3) Wound bleeding may indicate a slipped suture, dislodged clot, coagulation problem, or trauma placed on blood vessels or tissues

(4) Inspection of the wound and dressing aids in detecting increase drainage and color changes

(5) If bleeding occurs internally
  (a) Dressing may remain dry while the abdominal cavity collects blood
  (b) Patient will have increase thirst, restlessness, rapid, thready pulse, decreased blood pressure, decreased urinary output, and cool, clammy skin
  (c) Abdomen will become rigid and distended
  (d) If not detected, hypovolmic shock can cause circulatory system to collapse, causing death

(6) Dehiscence – wound layers have separated
  (a) Patient may say that something has ‘given way’
  (b) May result after periods of sneezing, coughing, or vomiting
  (c) Evidence of new or increased serosanguineous drainage on the dressing is an important sign to assess
  (d) Management:
    (i) Patient should remain in bed
    (ii) Kept NPO
    (iii) Told not to cough
    (iv) Always reassure patient
    (v) Place sterile dressing over area until physician evaluates the site

(7) Evisceration – abdominal organs protrude through opened incision
  (a) Patient is to remain in bed

(b) Wound and contents should be covered up with warm, sterile saline dressings
(c) Surgeon is notified immediately – this is a medical emergency

(8) Wound infection, or wound sepsis – results when the surgical wound becomes contaminated
(a) CDC labels a wound infected when it contains purulent (pus) drainage
(b) Patient with an infected wound displays a fever, tenderness and pain at the wound, edema, and an elevated WBC
(c) Purulent drainage has an odor and is brown, yellow or green, depending on the pathogen

TERMINAL LEARNING OBJECTIVE

Give the necessary medical equipment in a holding or ward setting. You are providing casualty care as part of an integrated team in a Minimal Care Ward.

Suctioning Techniques

Suctioning

Used to clear the airway of excessive secretions when the patient is unable to clear the respiratory tract with coughing.

Signs and symptoms of excess secretions

(1) Assess oral cavity: gurgling noise on inspiration or expiration, obvious oral secretions, drooling, gastric secretions or vomitus in mouth, and productive cough without expectorating secretions from the mouth.

(2) Assess for lower airway obstruction: coughing, secretions in the airway, labored breathing, restlessness or irritability, unilateral breath sounds, cyanosis, decreased oxygen saturations or level of consciousness, increased fatigue, dizziness, increased pulse rate, increased respiratory rate and/or elevated blood pressure.

Assess lung sounds

Auscultating all lung fields for adventitious sounds such as rhonchi, rales and or wheezing.

Assess the patient's understanding of the procedure

Remove excess secretions by one of the primary suctioning techniques.

Three primary suctioning techniques

(1) Oropharyngeal suctioning-used when the patient is able to cough effectively but is unable to clear secretions by expectorating or swallowing.

(2) Nasotracheal suctioning-necessary when the patient with pulmonary secretions is unable to cough and does not have an artificial airway.

(3) Tracheal suctioning-accomplished through an artificial airway. The artificial airway may be an endotracheal or nasotracheal tube or it may be a tracheostomy tube.

Preparation for all techniques/types of suctioning

(1) Verify MD/PA order as required for procedure. Some hospitals require a physicians order to suction the trachea

(2) Explain the procedure to the patient and the reason that it is to be done. Explain how the procedure with help clear the airway and relieve breathing problems and that temporary coughing, sneezing, gagging, or shortness of breath is normal.

(3) Gather equipment necessary to correctly perform the procedure. Some facilities have commercially prepared suctioning kits. Check what is available in your facility or check procedural manuals for equipment lists.

(4) Don gloves (nonsterile) and use mask or face shield as per local policy
(5) Fill basin or cup with approximately 100 cc of water
(6) Connect one end of connecting tubing to suction machine. Check that equipment is functioning properly by suctioning a small amount of water from basin
(7) Turn on suction device. Set regulator to appropriate negative pressure: wall suction, 80-120 mm Hg; portable suction, 7-15 mm Hg for adults

NOTE: Elevated pressure settings increase risk of trauma to mucosa

Oropharyngeal suctioning

(1) Attach suction catheter to connecting tubing. Remove oxygen mask from patient if present. Nasal cannula or prongs may be left in place while performing this type of suctioning.
(2) Assist the patient to assume comfortable position for the procedure. Usually this will be a semi-Fowler's position or sitting upright. Proper positioning reduces stimulation of the gag reflex, promotes patient comfort and aids in secretion drainage.
(3) Insert catheter into patient's mouth. With suction applied, move the catheter around the mouth, including the pharynx and the gum line until secretions are cleared. If the catheter does not have a suction control to apply intermittent suction, take care not to traumatize oral mucosal surfaces with continuous suctioning.

NOTE: Oropharyngeal suctioning is usually performed using a rigid plastic catheter with one large and several small eyelets that mucous enters when suction is applied. This type of catheter is called a Yankauer or tonsil suctioning device. Alert patients can be taught to use this device to control excess secretions in the mouth.

(1) Encourage the patient to cough. Coughing moves secretions from the lower and upper airway into the mouth where they can be easily suctioned.
(2) Repeat suctioning as needed until the mouth is clear of excess secretions.
(3) Replace the oxygen mask if removed earlier.
(4) Suction water from the basin through the catheter until the catheter is cleared of secretions. Clearing secretions from the catheter and the tubing before they dry reduces the possibility of transmission of microorganisms and insures delivery of accurate suction pressures.
(5) Place the catheter in a clean, dry area for reuse with the suction turned off. If the patient has been taught to use the suction catheter, leave the suction on and the catheter within reach of the patient.
(6) Dispose of water and clean the basin as per policy. Remove your gloves and dispose of per local policy.

Nasotracheal suctioning

(1) Open suction kit or catheter using aseptic technique. If sterile drape is available, place it across the patient's chest. Do not allow the suction catheter to touch any non sterile surfaces

(2) Unwrap or open a sterile basin and place on the bedside table. Be careful not touch the inside of the sterile basin. Fill the basin with approximately 100 cc of sterile Normal Saline (NS).

(3) Apply one sterile glove to each hand, or apply non sterile glove to nondominant hand and sterile glove to dominant hand. Attach non sterile suction tubing to sterile catheter, keeping hand holding catheter sterile.

(4) Secure catheter to tubing aseptically. Coat distal 2-3 inches of catheter with water-soluble lubricant (K-Y Jelly/Lubricant).

(5) Remove oxygen delivery device, if present, with nondominant hand. **Without applying suction** and using the dominant thumb and forefinger, gently, but quickly insert the sterile catheter into either naris during inhalation with a slight downward slant. Do not force the catheter. Try the other naris if insertion meets resistance or is difficult to insert.

NOTE: Never apply suction during insertion. Application of suction pressure while introducing the catheter into the trachea increases risk of damage to the mucosa and increases the risk of hypoxia because the removal of oxygen present in the airway. Remember that the epiglottis is open during inspiration and facilitates insertion of the catheter into the trachea.

(6) Insert the catheter approximately 16-20 cm (6 ½-8 inches) in the adult patient. One method of measuring the correct length of catheter to insert is to use the distance from the patient's nose to the base of the earlobe as a guide.

(7) Apply intermittent suction by placing and releasing nondominant thumb over the vent of catheter. Slowly withdraw the catheter while rotating it back and forth with suction on for as long as 10-15 seconds.

(8) Assess the need to repeat suctioning procedure. Allow adequate time between suction passes for ventilation and oxygenation. Ask the patient to deep breathe and cough. Keep oxygen readily available in case the patient exhibits signs of hypoxemia. Administer oxygen to the patient between suctioning attempts

(9) When the pharynx and trachea are cleared of secretions, perform oral suctioning to clear the mouth of secretions. Do not suction the nose or trachea after suctioning the mouth.

(10) Rinse the catheter and connecting tubing by suctioning NS from the basin until the tubing is clear. Dispose of equipment as per facility policy. Turn off suction device

Endotracheal or tracheostomy tube suctioning

(1) Performed through an artificial airway (endotracheal/nasotracheal or tracheostomy). Artificial airways are indicated for patients with deceased level of consciousness, airway obstruction, mechanical

ventilation and for removal of tracheal bronchial secretions. Artificial airways allow easy access to the patient's trachea for deep tracheal suctioning.

(2) Prepare suction equipment, suction catheter using sterile technique and don sterile gloves as previously descr bed for nasotracheal suctioning

(3) Hyper oxygenate the patient before suctioning, using manual resuscitation Ambu-bag connected to an oxygen source.

(4) Open swivel adapter or if necessary remove the oxygen delivery device (ventilator tubing) with your nondominant hand.

(5) **Without applying suction**, gently, but quickly insert the sterile catheter using the dominant thumb and forefinger into the artificial airway until resistance is met, or the patient coughs and them pull back the catheter approximately ½ inch.

(6) Apply intermittent suction by placing and releasing nondominant thumb over the vent of the catheter while rotating it back and forth between the dominant thumb and forefinger. Encourage the patient to cough, if possible. Observe continuously for respiratory distress.

NOTE: If the patient develops respiratory distress during the suctioning procedure, immediately withdraw the catheter and administer additional oxygen and breaths as needed.

(7) Close the swivel adapter, or replace the oxygen delivery device (ventilator tubing).

(8) Rinse catheter and tubing with NS

(9) Assess for secretion clearance. Repeat suctioning procedure 1-2 times more to clear secretions if necessary. Allow adequate time between suction passes (at least one full minute) for ventilation and oxygenation.

(10) Perform oropharyngeal suctioning as needed. Catheter is now contaminated. **Do not** reinsert into the artificial airway.

(11) Dispose of suctioning equipment per policy. Turn off suction device

(14) Reposition the patient as indicated by condition

Record-

The amount, consistency, color and any odor of secretions and the patient's response to the procedure. Document the patient's pre- and post suctioning respiratory status.

Continue to monitor patient's vital signs

Include pulse oximetry if available.

Perform Endotracheal Tube and Tracheostomy Care

Artificial airways

Place the patient at high risk for infection and make the patient more susceptible to airway injury.

Endotracheal (ET) tubes

Used as short-term artificial airways and are used to administer mechanical ventilation, relieve upper airway obstruction, and protect the patient from aspiration or clear excessive secretions. ET tubes may be placed either nasally or orally. They are generally removed within 14 days.

Patients who require artificial airway assistance for longer than 14 days usually require a tracheostomy. This procedure involves a surgical incision to be made into the trachea and a short, artificial airway (trach tube) is inserted. This procedure is normally accomplished in the operating room under sterile conditions.

Endotracheal (ET) tube care

(1) Verify MD/PA order as required by facility
(2) Explain the procedure to the patient and reason it is being done in terms the patient understands
(3) Gather equipment necessary to perform the procedure
(4) Initiate and perform endotracheal suctioning prior to the procedure. This allows for the removal of secretion and diminishes the patient's need to cough during the procedure.
(5) Connect oral suction catheter (Yankauer) suction to suction device
(6) Prepare tape. Cut piece of tape long enough to go completely around the patient's head from nares to nares (nasal ET tube) or from edge of mouth to edge of mouth (for oral ET tube) plus approximately 6 inches. Lay adhesive side up on table and cut and lay approximately 6 inches of tape, adhesive side down, in the center of the long strip. This will prevent the longer piece of tape from sticking to the patient's skin and hair on the back of the head/neck.
(7) Carefully remove tape from the ET tube and the patient's face. An assistant may be required to help hold the ET tube in place so that the tube does not move. This is especially important in an uncooperative patient.
(8) Remove excess adhesive from the face with adhesive remover if necessary.
(9) Remove bite block or oral airway if present
(10) Clean mouth, gums and teeth with NS or mouthwash solution and a 4 X 4 gauze, sponge tipped applicator or saline swabs. Brush teeth if necessary and suction oral cavity with Yankauer suction.
(11) Clean face and neck with soap and water. Shave the make client as necessary.
(12) Apply tincture of benzoin to the upper lip (oral ET tube) or across nose (nasal ET tube) and cheeks to ears. Allow to dry completely.
(13) Slip tape under the patient's head and neck, adhesive side down. Do not twist tape or catch hair. Do not allow tape to stick to itself. Center tape so that the double-faced tape extends around the back of the neck from ear to ear.
(14) On one side of the face, secure tape from ear to nares (nasal ET tube) or edge of mouth (oral ET tube). Tear remaining tape in half, length wise, forming two pieces that are ½ to ¾ inch wide. Secure

bottom half of tape across upper lip (oral ET tube) or across tope of nose (nasal ET tube). Wrap top half around the ET tube.

(15) Gently pull other side of tape firmly to pick up slack and secure to remaining side of face.

(16) Clean oral airway in warm soapy water and rinse well. Hydrogen peroxide can aid in the removal of crusty secretions.

(14) Reinsert oral airway being careful not to push the tongue into the oropharnyx

Tacheostomy Care

(1) Suction trach. Suctioning prior to the procedure removes secretions so that they do not occlude the outer cannula while the inner cannula is removed. Reduces the need for the patient to cough during the procedure.

(2) Open sterile trach care kit (commercially available). Open three 4 X 4 sterile gauze packages using aseptic technique and pour NS on one package and hydrogen peroxide on another. Leave the third package dry.

(3) Open two packages of cotton tipped swabs and pour NS on one package and hydrogen peroxide on the other.

(4) Open sterile trach package. Unwrap sterile basin and pour about 1 inch of hydrogen peroxide into it. Open small sterile brush package and place aseptically into the basin.

(5) Measure and cut twill trach tape long enough to around the patient's neck two times (approximately 24-30 inches. Cut ends on a diagonal. Lay aside in a dry area.

(6) Don sterile gloves. Keep dominant hand sterile throughout the procedure.

(7) Remove oxygen source/ventilator tubing.

(8) Remove inner cannula of trach with a slight twisting motion with the nondominant hand and drop the cannula into the hydrogen peroxide basin

(9) Place oxygen source over or near the outer cannula. Oxygen delivery tubing cannot be attached to all outer cannulas when the inner cannula is removed.

(10) Quickly clean the inner cannula with the brush to remove secretions inside and outside the cannula. Rinse with NS, using the nondominant hand to pour.

(11) Replace the inner cannula and secure the locking mechanism with a slight twisting motion. Reapply the oxygen/ventilator source.

(12) Using hydrogen peroxide prepared cotton-tipped swabs and 4 X 4 gauze, clean the outer cannula surfaces and stoma under the faceplate of the trach tube, extending 2-4 inches in all directions from the stoma. Clean in a circular motion from stoma site outward. Always remember to use the dominant hand to handle sterile supplies

(13) Using NS prepared cotton-tipped swabs and 4 X 4 gauze, rinse hydrogen peroxide from the trach tube and skin.

(14) Using dry 4 X 4 gauze, pat dry the outer cannula and skin surfaces.

(15) Replace trach tie. If assistant available, have them hold the trach in place while old tie is cut and removed and new tie is applied. If no assistant is available, apply new tie before removing the old one.
(16) To replace the trach tie, insert one end of the tie through faceplate eyelet and pull ends even
(17) Slide both ends of behind the head and around the neck to the other eyelet and insert one tie through the second eyelet.
(18) Pull snug
(19) Tie ends securely in a double square knot, allowing space for only one finger in tie
(20) Insert fresh trach dressing under clean ties and faceplate.
(21) Assist patient to position of comfort and assess respiratory status.

Record respiratory assessments before and after care.

Record ET tube care-

Include frequency and extent of care, patient response to care and any abnormal findings to include skin breakdown/irritation.

Record tracheostomy care-.

Note size of trach tube, frequency and extent of care, patient tolerance of care and any abnormal findings to include signs of an infected stoma (increased redness, purulent drainage), skin breakdown/irritation.

Continue to monitor patient's vital signs-

Include pulse oximetry, if available.

Administer a nebulization treatment

Nebulization

Process of adding moisture or medications to inspired air by mixing particles of varying size using compressed air or oxygen.

Nebulizer-

Uses the aerosol principle to suspend a maximum number of water drops or particles of the desired size in inspired air.

Nebulization-

Often used for the administration of bronchodilator in the treatment of asthma

Administer a nebulization treatment

(1) Verify MD/PA order for treatment
(2) Verify patient's allergies to medications
(3) Prepare medication. Usually administer a bronchodilator such as a buterol, 0.2-0.3 ml in 3cc normal saline (NS). This medication is often available in unit dose packages. Check with facility for what is available.
(4) Assemble nebulizer as directed. Nebulizers are now pre-packaged, disposable systems for individual patient use.

(5) Place medication and NS into receptacle and screw lid onto medication receptacle. Attach the mouthpiece to the receptacle and attach the reservoir tubing to the other end.
(6) Connect the nebulizer to the compressed air or oxygen source. Oxygen is usually used to administer a nebulization treatment to a patient having an acute asthmatic attack.
(7) Turn on the compressed air/oxygen until you observe a fine mist coming from the mouthpiece of the nebulizer. This usually requires at least 10-12 LPM of the compressed air/oxygen.
(8) Have the patient place the mouthpiece in their mouth and close their lips around the mouthpiece.
(9) Patient should inhale the medication as deeply as possible and exhale through the nebulizer. The patient does not need to remove the nebulizer from their mouth to exhale. Make sure the patient does not hyperventilate nor hold his breath.
(10) The treatment should last 5-10 minutes.
(11) Upon completion of the treatment, turn off the compressed air/oxygen.
(12) Assess the respiratory status of the patient by auscultating the lungs
(13) Monitor vital signs to include pulse oximetry if available
(14) Document the treatment to include time, medication, deliver system and patient's response to treatment.

TERMINAL LEARNING OBJECTIVE

Give the necessary medical equipment in a holding or ward setting. You are providing casualty care as part of an integrated team in a Minimal Care Ward, perform basic nursing care IAW *Advanced Cardiac Life Support*, *Emergency Medicine*, *Nursing Interventions and Clinical Skills*.

Basic Cardiac Monitoring

Electrocardiogram (ECG)

(1) Graphic record of heart's electrical activity
(2) Body acts a conductor of electricity and the heart is the largest generator of electrical energy
(3) Electrodes placed on the skin can detect total electrical activity within the heart
(4) Electrical impulses on the skin surface have very low voltage. The ECG machine amplifies these impulses and records them on the ECG graph paper or on a monitor screen called an oscilloscope.
(5) Positive impulses appear as "upward" deflections on the graph paper or monitor screen
(6) Negative impulses appear as "downward" deflection on the graph paper or monitor screen
(7) Absence of any electrical impulse produces an isoelectric or "flat" line
(8) "Artifacts" are deflections the ECG produced by factors other than the electrical activity of the heart. Common causes are:
  (a) Muscle tremors
  (b) Shivering
  (c) Patient movement
  (d) Loose electrodes
  (e) 60 cycle interference
  (f) Machine malfunction
(9) Eliminate all artifacts before attempting to record an ECG
  (a) Replace loose electrodes
  (b) Cover patient with a blanket to prevent shivering
  (c) Wipe oily skin or diaphoretic skin with alcohol and then attach leads to increase adherence to the skin

ECG Leads

(1) Monitors heart's electrical activity by monitoring voltage change through electrodes placed at various places on the body surface
(2) Each pair of electrodes is called a "lead"
(3) Basic cardiac monitoring uses only 3 leads
(4) Three types of ECG leads are:
  (a) Bipolar
  (b) Augmented
  (c) Precordial
(5) Bipolar leads are the most frequently used and have one positive electrode and one negative electrode

(6) Leads I, II and III commonly called limb leads are bipolar and are the most frequently used leads in basic cardiac monitoring

NOTE: In the definitive care facility, 12 leads are normally used to detect a variety of conduction abnormalities, to include the presence and location of a myocardial infarction. This technique requires the use of augmented limb leads and precordial leads and allows the examination of the heart in two planes.

(7) Bipolar leads provide only three views of the heart's electrical activity, which is adequate for detecting life-threatening dysrhythmias

Routine ECG Monitoring

(1) Routine ECG monitoring generally uses only one lead
(2) Most commonly monitored leads are either Lead II or the modified chest lead 1 (MCL1),
(3) Lead II is used more frequently because most of the heart's electrical current flows toward its positive axis. This lead gives the best view of the ECG waves and best shows the heart's conduction system's activity.

NOTE: MCL is a special monitoring lead that some systems use selectively to help determine the origin of abnormal complexes such as premature beats.

Lead Placement

(1) Electrodes are place on the chest wall
(2) Positive lead is placed at the apex of the heart-usually a few inches below the left nipple. Often the leads are marked for placement, RA (right arm), LA (left arm), etc.
(3) The negative electrode is place below the right clavicle
(4) The third electrode, the ground, is place somewhere on the left upper chest wall, usually below the left clavicle

Advantages of single lead monitoring:

(1) Simple system
(2) Provides rate of the heartbeat
(3) Provides regularity of the heartbeat
(4) Provides conduction time of the impulse through the heart
(5) Detects life threatening dysrhythmias

Disadvantages of single lead monitoring

(1) Does not provide the presence or location of an infarct
(2) Does not provide right-to-left differences in conduction or impulse formation

(3) Does not provide information on the quality or presence of pumping action

Perform a 12 Lead ECG

Check equipment

(1) Ensure machine is turned on and allow ample time to warm up
(2) Inspect machine for any malfunctions
(3) Check machine's paper supply
(4) Ensure all equipment is on hand
  (a) Diskette
  (b) Clean electrodes

Gather information for Electrocardiogram Report

(1) Patient age
(2) Patient sex
(3) Race
(4) Weight
(5) Height
(6) Signature of requesting MD/PA
(7) Date and time of recording
(8) Patient diagnosis or reason for recording
(9) Current medications
(10) Previous ECGs
(11) Priority of processing
(12) Patient identification
  (a) Patient name and rank
  (b) Social security number
  (c) Company assignment if active duty
  (d) Home phone number if retired

Procedure for recording a standard 12-lead ECG

(1) Explain procedure to the patient
(2) Select electrode sites
  (a) Arms - anterior forearm and biceps
  (b) Legs - medial aspect of lower leg
  (c) Chest positions
    (i) V1 - fourth intercostal space, right sternal
    (ii) V2 - fourth intercostal space, left sternal
    (iii) V3 - midway between V2 and V4
    (iv) V4 - fifth intercostal space, midclavicular line
    (v) V5 - same level as V4, anterior axillary line
    (vi) V6 - same level as V4 and V5, midaxillary line
  (d) Special cases of placement
    (i) Amputees - place lead proximal to stump
    (ii) Hairy skin surface - if hair is excessive, rub with alcohol

(iii) Female - place lead under breast
(iv) Exceptionally oily skin - rub with alcohol
(v) Hard or scaly skin - rub with alcohol
(vi) Parkinson's disease
* Place electrode high on limb
* Elevating extremities in resting position may help control shaking
(vii) Skin rashes
* Find area without a rash
* If possible, rub with alcohol
(viii) Metal particles embedded in skin - move electrode site

(3) Wipe selected area with alcohol before applying electrode
(4) Application of electrodes
(a) Ensure electrodes are not falling off patient
(b) Ensure patient cable is not twisted and not interfering with other leads
(c) Select flat, fleshy site on arms and legs, avoid bone
(5) Press record ECG button
(a) Remind patient to relax
(b) Check leads for contact
(6) Recognize a good ECG
(a) Sharp distinct baseline
(b) Free from artifact
(c) Centered on graph
(7) Disconnect ECG
(a) Disconnect patient
(b) Clean electrode surfaces as you remove them from the patient

Identify general problems

(1) Muscle tremor
(a) Causes
(i) Patient uncomfortable or cold
(ii) 60-cycle interference
(b) Correction
(i) Ensure patient comfort. Provide a cover if room is cold.
(ii) Ensure patient is not holding anything in their hand
(iii) Ensure feet are not touching the wall or foot board
(2) 60-cycle interference
(a) Causes
(i) Ungrounded electrocardiograph
(ii) Ungrounded electrical outlet
(iii) Ungrounded equipment that is connected to same electrical outlet
(b) Correction

(i) Change electrical outlets
(ii) Change electrocardiograph, if possible
(iii) Notify MD/PA and medical maintenance

(3) Wandering baseline
(a) Causes
(i) Poor electrode contact
(ii) Cable pulling on electrodes
(iii) Cable moving with respirations
(b) Correction
(i) Check electrodes to ensure good contact
(ii) Adjust patient cable and move electrocardiograph closer to patient
(iii) Move cable off abdomen and guide under patient's arm to stabilize from moving

Right Side and Posterior ECG's

Right side and Posterior ECG's are recorded to aid the MD/PA in diagnosing the location of a myocardial infarction

(1) Explain the procedure to the patient
(2) Select electrode sites
(a) Chest positions: V3R - 6R, are placed on the right side of the chest in the same locations as the Left side leads V3-6 would be placed. V2R is therefore the same as V1
(i) V1R - fourth intercostal space, left sternal border
(ii) V2R - fourth intercostal space, Right sternal border
(iii) V3R - midway between V2R and V4R
(iv) V4R - fifth intercostal space, midclavicular line
(v) V5R - same level as V4R, anterior axillary line
(vi) V6R - same level as V4R and V5R, midaxillary line
(b) All other preparation and clean up steps of the procedure remain the same as for standard 12-lead ECG

Posterior ECG's

(1) Explain the procedure to the patient
(2) Select electrode sites
(a) Leads for a posterior ECG are placed in a horizontal line across the back
(b) Back Positions: May be done with standard left-side ECG - V7, 8, 9 or with Right-sided ECG - V7R, 8R, 9R
(i) V7 - Posterior axillary line
(ii) V8 - Posterior Scapular line
(iii) V9 - Left border of the spine
(iv) V7R - Right posterior axillary line
(v) V8R - Right posterior scapular line
(vi) V9R - Right border of the spine

(c) All other preparation and clean up steps of the procedure remain the same as for standard 12-lead ECG

Measure Pulse Oxygen Saturation

Pulse oximetry defined

(1) Noninvasive measurement of arterial oxygen saturation
(2) Assess level of oxygen in the blood available to the body tissues
(3) Reflects percent of hemoglobin that is bound with oxygen in the arteries
(4) Expressed as a percentage
  (a) For example, 96% indicates 96% of the hemoglobin molecules are carrying oxygen molecules
  (b) The more hemoglobin is saturated, the higher the percentage
  (c) Normally over 90%
  (d) An arterial blood gas (ABG) is an invasive procedure that may also be used to measure arterial oxygen saturation
(5) Pulse oximetry is accurate to +/- 2% for all readings over 70%
(6) Pulse oximetry is simple, painless, and has fewer risks than obtaining an ABG

Pulse oximeter - how it works

(1) Probe with a light-emitting diode (LED) connected by cable to an oximeter
(2) Light waves emitted by LED are absorbed and reflected back by oxygenated and deoxygenated hemoglobin molecules
(3) Reflected light is processed by the oximeter, which calculated the arterial oxygen saturation
(4) The oximeter sensor probe is applied to:
  (a) Finger
  (b) Toe
  (c) Earlobe
  (d) Bridge of the nose

Considerations

(1) Patients at risk for unstable oxygen status
  (a) Acute respiratory disease
  (b) Chronic respiratory disease
  (c) Ventilator dependence
  (d) Chest pain
  (e) Activity intolerance
  (f) Recovery from general anesthesia
  (g) Recovery from conscious sedation
  (h) Traumatic injury to chest wall
  (i) Changes in supplemental oxygen therapy
(2) Medications or treatments that may influence oxygen saturation
  (a) Oxygen therapy

(b) Respiratory therapy

(3) Factors that influence oxygen saturation - abnormalities in type of amount of hemoglobin affect the ability of oxygen to be carried to the tissues

(4) Factors likely to interfere with accuracy of pulse oximeter
- (a) Skin pigmentation - darker pigments can result in false-high readings
- (b) Jaundice
- (c) Intravascular dyes

(5) Assess pertinent laboratory values, including hemoglobin and ABGs if available
- (a) Anemia affects ability of oxygen to attach to hemoglobin molecule
- (b) ABGs measure arterial oxygen saturation, which serves as a standard and provides a basis for comparison

(6) Determine client-specific sit appropriate to place pulse oximeter probe by measuring capillary refill
- (a) Site must have adequate circulation
- (b) Moisture, dark nail polish, and acrylic nails impede sensor detection of emitted light and produce falsely elevated arterial oxygen saturation levels

(7) Determine previous baseline from patient's records

Application of pulse oximeter

(1) Select site and determine capillary refill

(2) Attach sensor probe to selected site

(3) Turn on oximeter
- (a) Observe pulse waveform/intensity display
- (b) Compare oximeter pulse rate with client's radial pulse

(4) Once oximeter reaches constant value, read arterial oxygen saturation on display

(5) Continually monitor arterial oxygen saturation levels

(6) Notify MD/PA of drastic changes

TERMINAL LEARNING OBJECTIVE

Give the necessary medical equipment in a holding or ward setting. You are providing casualty care as part of an integrated team in a Minimal Care Ward. Performed basic nursing care for casualty without causing further injury or illness.

Chest Tube Systems

Pleur-Evac chest drainage system

(1) One-piece molded plastic unit that duplicates the three-bottle system
(2) Cost effective
(3) There must be bubbles flowing in the suction control portion of the unit to provide suction to the patient

Pleur-Evac Set Up

(1) Fill water seal chamber
(2) Fill suction control chamber
(3) Attach tube to suction source
(4) Tape all the connections
(5) Provide sterile tube for connection to patient

Procedure for Proper Usage of the Heimlich Valve

(1) Heimlich valve is a plastic, portable one-way valve used for chest drainage, draining into a vented bag
(2) Equipment
  (a) Heimlich valve
  (b) Kelly clamps - 2 (rubber-tipped)
  (c) Vented drainage bag or ostomy bag
  (d) Ostomy tape or rubber band
  (e) Suction setup (if applicable)
  (f) Clean scissors
(3) Procedure Steps
  (a) Gather equipment and bring to patient area
  (b) Wash hands
  (c) Don gloves. Nonsterile gloves are acceptable as long as sterile technique is maintained while the connection is being made.
(4) Heimlich Valve To Chest Tube
  (a) Place rubber-tipped Kelly clamps in opposite directions on the proximal end of the chest tube as near to the patient as possible
  (b) Connect the chest tube to the blue end of the Heimlich valve using sterile technique

CAUTION: Only the blue end of the Heimlich valve can be connected to the chest tube. If the clear end is connected, the one-way valve will be in the wrong position and no drainage will take place.

  (c) Tape the connection site at both ends of the valve using 2 inch cloth tape.

CAUTION: When two chest tubes are present, two Heimlich valves must be used to ensure proper functioning of chest tubes.

(d) Monitor and record character of drainage and patency of valve in nursing progress notes.

CAUTION: Measure all drainage in a calibrated cylinder for accurate readings.

(e) Record drainage output on I & O graphic every 8 hours. If conditions permit.

Care of patients with chest tubes

Assess patient for respiratory distress and chest pain, breath sounds over affected lung area, and stable vital signs

Observe for increase respiratory distress

Observe the following:

(1) Chest tube dressing, ensure tubing is patent
(2) Tubing kinks, dependent loops or clots
(3) Chest drainage system, which should be upright and below level of tube insertion

Provide two shodded hemostats for each chest tube, attached to top of patient's bed with adhesive tape. Chest tubes are only clamped under specific circumstances:

(1) To assess air leak
(2) To quickly empty or change collection bottle or chamber; performed by soldier medic who has received training in procedure
(3) To change disposable systems; have new system ready to be connected before clamping tube so that transfer can be rapid and drainage system reestablished
(4) To change a broken water-seal bottle in the event that no sterile solution container is available
(5) To assess if patient is ready to have chest tube removed (which is done by physician's order); the solider medic must monitor patient for recreation of pneumothorax

Position the patient to permit optimal drainage

(1) Semi-Flower's position to evacuate air (pneumothorax)
(2) High Flower's position to drain fluid (hemothorax)

Maintain tube connection between chest and drainage tubes intact and taped

(1) Water-seal vent must be without occlusion
(2) Suction-control chamber vent must be without occlusion when suction is used

Coil excess tubing on mattress next to patient. Secure with rubber band and safety pin or system's clamp

Adjust tubing to hang in straight line from top of mattress to drainage chamber. If chest tube is draining fluid, indicate time (e.g., 0900) that drainage was begun on drainage bottle's adhesive tape or on write-on surface of disposable commercial system

(1) Strip or milk chest tube only per MD/PA orders only
(2) Follow local policy for this procedure

Problems solving with chest tubes

Problem: Air leak

(1) Problem: Continuous bubbling is seen in water-seal bottle/chamber, indicating that leak is between patient and water seal
  (a) Locate leak
  (b) Tighten loose connection between patient and water seal
  (c) Loose connections cause air to enter system.
  (d) Leaks are corrected when constant bubbling stops
(2) Problem: Bubbling continues, indicating that air leak has not been corrected
  (a) Cross-clamp chest tube close to patient's chest, if bubbling stops, air leak is inside the patient's thorax or at chest tube insertion site
  (b) Unclamp tube and notify physician immediately!
  (c) Reinforce chest dressing

Warning: Leaving chest tube clamped caused a tension pneumothorax and mediastinal shift

(3) Problem: Bubbling continues, indicating that leak is not in the patient's chest or at the insertion site
  (a) Gradually move clamps down drainage tubing away from patient and toward suction-control chamber, moving one clamp at a time
  (b) When bubbling stops, leak is in section of tubing or connection distal to the clamp
  (c) Replace tubing or secure connection and release clamp
(4) Problem: Bubbling continues, indicating that leak is not in tubing
  (a) Leak is in drainage system
  (b) Change drainage system

Problem: Tension pneumothorax is present

(1) Problems: Severe respiratory distress or chest pain
  (a) Determine that chest tubes are not clamped, kinked, or occluded. Locate leak
  (b) Obstructed chest tubes trap air in intrapleural space when air leak originates within patient
(2) Problem: Absence of breath sounds on affected side
  (a) Notify physician immediately

(3) Problems: Hyperresonance on affected side, mediastinal shift to unaffected side, tracheal shift to unaffected side, hyptenstion or tachycardia
- (a) Immediately prepare for another chest tube insertion
- (b) Obtain a flutter (Heimlich) valve or large-guage needle for short-term emergency release or air in intrapleural space
- (c) Have emergency equipment (oxygen and code cart) near patient

(4) Problem: Dependent loops of drainage tubing have trapped fluid
- (a) Drain tubing contents into drainage bottle
- (b) Coil excess tubing on mattress and secure in place

(5) Problem: Water seal is disconnected
- (a) Connect water seal
- (b) Tape connection

(6) Problem: Water-seal bottle is broken
- (a) Insert distal end of water-seal tube into sterile solution so that tip is 2 cm below surface
- (b) Set up new water-seal bottle
- (c) If no sterile solution is available, double clamp chest tube while preparing new bottle

(7) Problem: Water-seal tube is no longer submerged in sterile fluid
- (a) Add sterile solution to water-seal bottle until distal tip is 2 cm under surface
- (b) Or set water-seal bottle upright so that tip is submerged

Appendix A
Wound Care
Competency Skill Sheets

Irrigation

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Identifies patient and explains procedure to patient.	P / F	P / F	P / F
b.	Performs patient care handwash.	P / F	P / F	P / F
c.	Assembles equipment needed.	P / F	P / F	P / F
d.	Positions and drapes patient as necessary.	P / F	P / F	P / F
e.	Positions waterproof pad under wound.	P / F	P / F	P / F
f.	Establishes a sterile field.	P / F	P / F	P / F
g.	Dons gown and goggles as appropriate.	P / F	P / F	P / F
h.	Dons clean gloves, removes dressing and discards.	P / F	P / F	P / F
i.	Assesses wound prior to irrigation, noting size, color, warmth, and amount of discharge or blood from wound.	P / F	P / F	P / F
j.	Removes gloves and performs a patient care handwash.	P / F	P / F	P / F
k.	Dons sterile gloves.	P / F	P / F	P / F
l.	Cleans area around wound.	P / F	P / F	P / F
m.	Fills irrigating syringe with solution; attach a soft catheter if needed for a deep wound with a small opening.	P / F	P / F	P / F
n.	Instills solution gently into wound, holding syringe 1" above wound. If using a catheter, gently insert into the wound opening until slight resistance is met, pull back and gently instills solution.	P / F	P / F	P / F
o.	Allows solution to flow from clean area of wound to dirty area.	P / F	P / F	P / F
p.	Refills solution and continue irrigation until solution return is clear.	P / F	P / F	P / F
q.	Blots wound edges with sterile gauze.	P / F	P / F	P / F
r.	Redresses wound.	P / F	P / F	P / F
s.	Removes gloves and all equipment, discarding in appropriate biohazard receptacles as required.	P / F	P / F	P / F
t.	Performs patient care handwash.	P / F	P / F	P / F
u.	Documents procedure.	P / F	P / F	P / F
v.	Verbalizes that he/she would report an increase in pain, fresh bleeding, retention of irrigant solution or sings of shock to MD/PA.	P / F	P / F	P / F

Instructor Comments:

Sterile Field

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Selects clean work surface above waist level.	P / F	P / F	P / F
b.	Assembles necessary equipment.	P / F	P / F	P / F
c.	Checks dates, labels and condition of packaging for sterility of equipment.	P / F	P / F	P / F
d.	Performs patient care handwash.	P / F	P / F	P / F
e.	Places pack directly on work surface and opens as described to ensure sterility of the sterile drape.	P / F	P / F	P / F
f.	Gently lifts drape up from its outer cover and lets it unfold by itself without touching any object; discards outer cover with the other hand.	P / F	P / F	P / F
g.	Grasps adjacent corner of drape and holds it straight up and away from body; now drape is properly places while using two hands. Drape must be held away unsterile surface.	P / F	P / F	P / F
h.	Holding drape, first positions the bottom half over the intended work surface.	P / F	P / F	P / F
i.	Allows top half of drape to be placed over work surface last.	P / F	P / F	P / F
j.	Performs procedure using sterile technique.	P / F	P / F	P / F

Instructor Comments:

Appendix B
Cardiac Monitoring
Competency Skill Sheets

Pulse Ox

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Selected site. If finger is selected, removed fingernail polish or acrylic nail.	P / F	P / F	P / F
b.	Determined capillary refill at site. If less than 3 seconds, selected alternative site.	P / F	P / F	P / F
c.	Position patient comfortably. (1) Supported lower arm if finger is chosen as monitoring site. (2) Instructed client to keep sensor probe site still.	P / F	P / F	P / F
d.	Attached sensor probe to selected site. Ensured photo detectors of light sensors are aligned opposite each other.	P / F	P / F	P / F
e.	Turned on oximeter by activating power. (1) Observed pulse waveform/intensity display and audible beep. (2) Compared oximeter pulse rate with patient's radial pulse.	P / F	P / F	P / F
f.	Left sensor probe in place until oximeter reaches constant value and pulse display reaches full strength.	P / F	P / F	P / F
g.	Read SpO2 on digital display.	P / F	P / F	P / F
h.	Checked SpO2 alarm limits, if continues SpO2 monitoring is planned . (1) Determined limits for SpO2 and pulse rate as indicated by patient's condition. (2) Verified alarms are on. (3) Relocated sensor probe every 4 hours (if indicated).	P / F	P / F	P / F
i.	Removed probe and turned off oximeter power.	P / F	P / F	P / F

Instructor Comments:

12 Lead EKG

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Checked equipment. (1) Ensured machine is turned on and allowed ample time to warm up. (2) Inspected machine for any malfunctions. (3) Checked machine's paper supply. (4) Ensured all equipment is on hand.	P / F	P / F	P / F
b.	Gathered patient information.	P / F	P / F	P / F
c.	Explained procedure to the patient.	P / F	P / F	P / F
d.	Selected electrode site (arms, legs, and chest positions).	P / F	P / F	P / F
e.	Considered special cases of placement.	P / F	P / F	P / F
f.	Wiped selected area with alcohol before applying electrode.	P / F	P / F	P / F
g.	Applied electrodes. (1) Ensured electrodes are not falling off patient. (2) Ensured patient cable is not twisted and not interfering with other leads.	P / F	P / F	P / F
h.	Pressed record EKG button. (1) Reminded patient to relax. (2) Checked leads for contact.	P / F	P / F	P / F
i.	Recognized a good EKG.	P / F	P / F	P / F
j.	Disconnected EKG. (1) Disconnected patient. (2) Cleaned electrode surfaces as removed from patient.	P / F	P / F	P / F

Instructor Comments:

Appendix C
Respiratory Care
Competency Skill Sheets

Nebulization

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Verified MD/PA order for treatment.	P / F	P / F	P / F
b.	Verified patient's allergies to medication.	P / F	P / F	P / F
c.	Prepared medication.	P / F	P / F	P / F
d.	Assembled nebulizer as directed.	P / F	P / F	P / F
e.	Placed medication and NS into receptacle. Screwed lid onto medication receptacle.	P / F	P / F	P / F
f.	Attached mouthpiece to receptacle. Attached reservoir tubing to other end.	P / F	P / F	P / F
g.	Connected nebulizer to compressed air or oxygen source.	P / F	P / F	P / F
h.	Turned on compressed air/oxygen until a fine mist is observed from mouthpiece of nebulizer (usually requires 10-12 LPM of compressed air/oxygen).	P / F	P / F	P / F
i.	Had patient place mouthpiece in mouth and close lips around mouthpiece.	P / F	P / F	P / F
j.	Instructed patient to inhale medication as deeply as possible and exhale through nebulizer. (1) Made sure patient did not hyperventilate or hold breath.	P / F	P / F	P / F
k.	Allowed treatment 5-10 minutes.	P / F	P / F	P / F
l.	Upon completion of treatment, turned off compressed air/oxygen.	P / F	P / F	P / F
m.	Assessed respiratory status by auscultating the lungs.	P / F	P / F	P / F
n.	Monitored vital signs, including pulse oximetry (if available).	P / F	P / F	P / F
o.	Documented treatment.	P / F	P / F	P / F

Instructor Comments:

Inhaler

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Verified MD/PA orders.	P / F	P / F	P / F
b.	Assessed patient's ability to hold, manipulate, and depress inhaler.	P / F	P / F	P / F
c.	Assessed patient's knowledge and understanding of purpose and action of prescribed inhaler.	P / F	P / F	P / F
d.	Assessed drug schedule and number of inhalations prescribed for each dose.	P / F	P / F	P / F
e.	Positioned patient comfortably.	P / F	P / F	P / F
f.	Gathered equipment and washed hands.			
g.	Allowed client opportunity to manipulate inhaler. Explained and demonstrated how canister fits into inhaler.	P / F	P / F	P / F
h.	Explained what metered dose is and warned patient about overuse of inhaler.	P / F	P / F	P / F
i.	Explained steps for administering inhaled dose of medication. (1) Removed mouthpiece cover from inhaler. (2) Shook inhaler well. (3) Had client take a deep breathe and exhale. (4) Instructed patient to position inhaler.	P / F	P / F	P / F
j.	With inhaler in proper position, had client hold inhaler with thumb at mouthpiece and index finger and middle finger at the top.	P / F	P / F	P / F
k.	Instructed client to tilt head back slightly, inhale slowly and deeply through mouth, and depressed medication canister fully.	P / F	P / F	P / F
l.	Had patient hold breath for approximately 10 seconds.	P / F	P / F	P / F
m.	Had patient exhale through pursed lips.	P / F	P / F	P / F
n.	Assessed patient's respirations.	P / F	P / F	P / F
o.	Documented procedure.	P / F	P / F	P / F

Instructor Comments:

Wall Mount O2

Soldiers Name: _____SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Verified MD/PA orders.	P / F	P / F	P / F
b.	Gathered equipment.	P / F	P / F	P / F
c.	Explained procedure to the patient.	P / F	P / F	P / F
d.	Positioned patient.	P / F	P / F	P / F
e.	Assess patient's airway. (1) Considered laboratory reports of arterial blood gas levels. (2) Suctioned any secretions obstructing the airway (3) Reassessed lung sounds.	P / F	P / F	P / F
f.	Filled humidifier container to designated level.			
g.	Attached flowmeter to humidifier and inserted in proper source.	P / F	P / F	P / F
h.	Administered oxygen via nasal cannula. (1) Attached nasal cannula to oxygen tubing. (2) Attached to flowmeter. (3) Placed prongs in cup of water. Adjusted flow meter to 6 to 10 L to flush tubing and prongs with oxygen. Once water, bubbles, removed and wiped off water. (4) Adjusted flow rate to prescribed amount. (5) Placed nasal prong into each naris of patient. Adjusted liter flow per order. (6) Adjusted straps of cannula over the ears and tighten under the chin. (7) Placed padding between strap and ear.	P / F	P / F	P / F
i.	Administered oxygen via face mask. (1) Adjusted flow rate of oxygen per order. (2) Allowed patient to hold mask and placed hand over patient's hand. (3) Placed mask over bridge of nose, then covered mouth. (4) Adjusted straps around patient's head and over ears. (5) Placed cotton ball or gauze over ears under elastic straps. (6) Observed reservoir bag. Ensure expanding and collapsing with patient's breath.	P / F	P / F	P / F
j.	Maintained regular assessment. (1) Maintained solution in humidifier. (2) Cleaned and dried nares/face as indicated.	P / F	P / F	P / F
k.	Documented procedure.	P / F	P / F	P / F

Instructor Comments:

Wall Mount Suction

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Verified MD/PA orders.	P / F	P / F	P / F
b.	Explained procedure to the patient.	P / F	P / F	P / F
c.	Gathered necessary equipment	P / F	P / F	P / F
d.	Donned gloves and used mask or face shield.	P / F	P / F	P / F
e.	Opened suction kit/catheter using aseptic technique.			
f.	Filled basin with approximately 100cc of Normal Saline.	P / F	P / F	P / F
g.	Connected one end of connecting tubing to suction machine. (1) Checked to ensure equipment if functioning by suctioning a small amount of water from basin.	P / F	P / F	P / F
h.	Turned on suction device. Set regulator to 80-120mm HG.	P / F	P / F	P / F

Oropharyngeal suctioning

a.	Attached suction catheter to connecting tubing.	P / F	P / F	P / F
b.	Removed oxygen mask. If nasal cannula is used, left in place.	P / F	P / F	P / F
c.	Positioned patient.	P / F	P / F	P / F
d.	Inserted catheter into patient's mouth.	P / F	P / F	P / F
e.	With suction applied, moved catheter around mouth.	P / F	P / F	P / F
f.	Encouraged patient to cough.	P / F	P / F	P / F
g.	Repeated suctioning as needed.	P / F	P / F	P / F
h.	Replaced oxygen mask if removed.	P / F	P / F	P / F
i.	Suctioned water from basin through catheter until the catheter is cleared of secretions.	P / F	P / F	P / F
j.	Placed catheter in clean, dry area.	P / F	P / F	P / F
k.	Turn off suction device.	P / F	P / F	P / F
l.	Disposed of water and cleaned basin.	P / F	P / F	P / F
m.	Removed gloves and washed hands.	P / F	P / F	P / F
n.	Documented procedure.	P / F	P / F	P / F

Nasotracheal suctioning

a.	Attached nonsterile suction tubing to sterile catheter.	P / F	P / F	P / F
b.	Secured catheter to tubing aseptically.	P / F	P / F	P / F
c.	Coated distal 2-3 inches of catheter with water-soluble lubricant.	P / F	P / F	P / F
d.	Removed oxygen delivery device.	P / F	P / F	P / F
e.	Without applying suction, used dominant thumb and forefinger to gently insert sterile catheter into either naris. Inserted during inhalation with slight downward slant.	P / F	P / F	P / F
f.	Inserted catheter approximately 16-20 cm or distance from patient's nose to base of the earlobe.	P / F	P / F	P / F
g.	Applied intermittent suction by placing and releasing nondominant thumb over vent of catheter.	P / F	P / F	P / F
h.	Assess the need to repeat suctioning procedure. (1) Allowed adequate time between suction passes for ventilation and oxygenation. (2) Asked patient to breathe deeply. Encourage coughing. (3) Kept oxygen readily available. (4) Administered oxygen to patient between suctioning attempts.	P / F	P / F	P / F
i.	Performed oral suctioning to clear mouth of secretions.	P / F	P / F	P / F
j.	Rinsed catheter and connection tubing.	P / F	P / F	P / F
k.	Disposed of equipment.	P / F	P / F	P / F
l.	Turned off suctioning device.	P / F	P / F	P / F
m.	Removed gloves and washed hands.	P / F	P / F	P / F
n.	Documented procedure.	P / F	P / F	P / F

Instructor Comments:

91W10
Advanced Individual TrainingCourse

Core Skills Handbook

Department of the Army
Academy of Health Sciences
Fort Sam Houston, Texas 78234

Perform a Casualty Assessment……1-9
- Determine threats
- Initial casualty assessment
- AMPLE history
- Immediate life-threatening injuries
- Additional casualty assessment

Airway Management and Oxygen Therapy……**10-22**
- Establish an airway
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Appendix A - Perform a Casualty Assessment, Competency Skill Sheets
- Primary survey
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Appendix B - Airway Management and Oxygen Therapy, Competency Skill Sheets
- Nasal Trumpet
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- Needle chest decompression

Appendix C - Control Bleeding, Competency Skill Sheets
- Primary survey
- IV infusion
- Mechanical methods

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked M5 Bag or Combat Medic Vest System. You encounter a casualty with suspected injuries, perform a casualty assessment IAW cited references.

Determine threats in the area near the casualty

The medic situational assessment differs from the civilian scene size-up in that it centers around an awareness of the tactical situation and current hostilities in order to safely and effectively render care

Examining the battlefield and determining zones of fire during engagement

(1) Determine routes of access to the casualty and egress with the casualty to ensure safety

(2) Casualties will occur over time, thus, changing the demands on your services and resources

Consider care under fire

(1) Anticipate the care you will offer at the casualty's side and what effect the care being given will have on drawing fire such as movement, noise or light

(2) Determine what care is best offered at the casualty's side and what is best given after movement to safety

(3) Do not offer extensive assessment and care until you can move the casualty to cover or at least concealment

As you enter a fire zone, recognize hazards, seek cover and concealment, and carefully scan the area for potential danger

(1) Survey the area for small arms fire

(2) Detect area for fire or explosive devices

(3) Determine threat for chemical or biological agents

(4) Survey building(s) structure for stability

Remove casualty to safe area if necessary prior to assessment or treatment

(1) Getting the casualty to cover (or concealment) may entail moving the casualty. Tell the casualty to move as quickly as poss ble to cover while maintaining a low profile. If the casualty is unable to move, the medic may need to assist the casualty using manual evacuation. The risk in moving the casualty is further injuries, but the benefit of protection outweighs the risk

(a) The medic should never hesitate to move a casualty who is exposed to fire. Each situation is different. You must evaluate the pros and cons of movement. If the casualty is not currently receiving fire and a C-spine injury is likely, you may elect to delay movement until it can be done safely.

(b) Ideally, choose a technique that is least likely to aggravate the casualty's injuries

(2) Request assistance. You should request assistance in movement and treatment prior to attempting to move casualty.
  (a) Direct Combat Life Savers (CLS) to provide treatment. CLS' will be utilized and directed by medical personnel once hostilities have ceased.
  (b) Assign individuals to perform self aid or buddy aid as needed
(3) Request covering fire to reduce the risk to you and the casualty during movement to and from the casualty's location
(4) Be sure that the location you are moving to will provide optimum cover and concealment. Plan you evacuation route prior to exposing yourself to hostile fire.
(5) Consider a NBC environment

Determine mechanism of injury
(1) Determine how the injury occurred
  (a) Burns
  (b) Ballistic, etc.
  (c) Falls
  (d) NBC
(2) Determine number of casualties: Request addition help, if available (this information can be obtained from situational reports and evacuation requests)
  (a) The number of casualties determines how and where you will treat
    (i) Consider care of casualties under fire
    (ii) Consider a mass casualty situation
  (b) Manage time, equipment and supplies for casualty treatment
  (c) Triage casualties

Perform Initial Casualty Assessment given a medic aid bag or CMVS

Form general impressions: Consider c-spine immobilization
(1) Observe position of casualty
  (a) Body position
  (b) Position in relation to surroundings
(2) Note activity in area surrounding casualty
  (a) Survey the area for small arms fire
  (b) Detect area for fire or explosive devices
  (c) Determine threat for chemical or biological agents
  (d) Survey building(s) structure for stability
(3) Appearance of casualty
  (a) Skin color
  (b) Severe bleeding
  (c) Obvious major injuries
  (d) Anxiety
  (e) Obvious distress - breathing, etc.

Assess airway

(1) Assess the airway and level of consciousness (LOC)
(2) Use common sense when opening the airway. Provide c-spine immobilization when necessary.
(3) If the casualty can ta k to you the airway is open and he/she is breathing
(4) Open the airway
  (a) Head-tilt/Chin-lift
  (b) Jaw thrust
(5) Sweep - use index finger to attempt to manually clear airway of obstructing object

Assess breathing

(1) LOOK--LISTEN--FEEL.
  (a) Can you **see** the chest rise and fall?
  (b) Can you **hear** the casualty breathing?
  (c) Can you **feel** the casualty breathing?
  (d) Regular & full = Normal
  (e) Labored, shallow, rapid, or irregular or absent = Abnormal
(2) Assist ventilations if abnormal breathing

Assess circulation

(1) Does the casualty have a pulse?
  (a) Palpate and compare the carotid and radial pulse in the adult and child casualty, and auscultate the apical pulse in the infant casualty
  (b) Full & regular = normal
  (c) Weak, thready, irregular = abnormal
  (d) Capillary Blanch Test
(2) Both pulses absent, start CPR. In a combat situation with multiple casualties, there may be limited opportunities to initiate CPR.
(3) Do not start CPR on a solider who has been shot and is in cardiopulmonary arrest except on a very limited basis

Assess disability/neurological status

(1) Level of mental status: Level of mental status has partially been assessed in the medic's general impression and airway assessment using AVPU:
  (a) Alert (awake and oriented)
  (b) Verbal - responds to verbal stimuli (awake but confused/unconscious but responds in some way)
  (c) Pain - responds to pain (unconscious be responds to pain)
  (d) Unresponsive (no gag or cough reflex)
(2) Pupils
  (a) Are they equal, round and reactive?
  (b) Pinpoint
  (c) Dilated

Expose wounds

(1) Remove equipment and clothing (Except in a NBC environment or field of fire) from area around wound
(2) Identify additional life-threatening injuries

Obtaining an AMPLE history

Allergies
(1) Primarily to medications, also environmental allergies
(2) Check ID tag to see if red allergy tag is affixed

Medication
(1) Prescribed medication
(2) Over-the-counter medication

Pertinent medical history: Associated injuries/complications

Last oral intake

Events preceding incident. "What were you doing at the time of injury?"

Identify immediate life-threatening injury(ies)

Control life-threatening hemorrhage
(1) Direct pressure
(2) Pressure dressing/pressure points
(3) Tourniquet

Treat for shock
(1) Provide supplemental oxygen
(2) Consider intravenous fluids
  (a) Utilize to reverse, or stabilize, effects of hypovolemia
  (b) Should not delay direct transport or oxygen interventions

Provide airway/breathing support
(1) Manual maneuvers
(2) Airway adjuncts
(3) Proper positioning
(4) Provide supplemental oxygen: Assist ventilations

Identify chest injury
(1) Look for:
  (a) Flail chest –multiple rib fractures that cause paradoxical chest movement
  (b) Open wounds
  (c) Tension pneumothorax
  (d) Hemothorax
  (e) Impaled objects
  (f) Lacerations

(g) Punctures
(h) Ecchymosis - bluish discoloration of an area of skin or mucous membrane cased by the etravasation of blood into the subcutaneous tissues as a result of trauma

(2) Provide immediate care
(a) Seal sucking chest wounds
(b) Stabilize flail chest
(c) Decompress tension pneumothorax
(d) Stabilize impaled objects

Assess the back

Assess the extremities

Perform additional casualty assessment given a medic aid bag

When performing a detailed trauma assessment

(1) Deformities
(2) Contusions
(3) Abrasions
(4) Punctures/penetrations
(5) Burns
(6) Tenderness
(7) Lacerations
(8) Swelling

Head

(1) Inspect for
(a) Obvious hemorrhage
(b) Ecchymosis, erythema, or contusions
(c) Scalp lesions

(2) Palpate (touching or feeling) for
(a) Lumps
(b) Tenderness
(c) Distension
(d) Crepitation
(e) Depressions

Eyes

(1) Inspect for
(a) PEARLA (Pupils, Equal, Round, Reactive, Light, Accommodation)
(b) Laceration to lid or globe
(c) Foreign matter in eye
(d) Unequal pupils (anisocoria)
(e) Eye movements
(f) Pupillary reaction
(g) Raccoon Eyes - which may indicate skull fracture

(2) Palpate for
(a) Swelling in orbital or periorbital area

(b) Failure to sense touch in supra-orbital and infraorbital areas if casualty is communicative

Ear - inspect for

(1) Discharge from external auditory canal
(2) Ecchymosis over mastoid (Battle's sign)
(3) Lacerations
(4) Bleeding
(5) Avulsions

Nose - inspect for

(1) Rhinorrhea
(2) Patent nostrils
(3) Bleeding
(4) Flaring of anterior nares on inspiration
(5) Septal hematoma

Mouth

(1) Inspect for
  (a) Potential airway obstruction
  (b) Edema or hemotoma to in tongue
  (c) Bleeding
  (d) Teeth or dentures lodged in pharynx
  (e) Misalignment of teeth
  (f) Pain when biting teeth together
(2) Palpate for fractures
  (a) Zygomatic bones
  (b) mandible
  (c) Maxilla

Neck

(1) Inspect for C-spine tend lacerations
  (a) Retraction at suprasternal notch on inspiration
  (b) Deviation of trachea from midline
  (c) Jugular vein distention (Step-offs)
(2) Auscultate for air sounds in trachea

Skin: Inspect for

(1) Jaundice
(2) Cyanosis
(3) Diaphoresis
(4) Temperature
(5) Moistness
(6) Pallor

Thorax

(1) Inspect for
  (a) Respiration
    (i) Rate-tachypnea
    (ii) Depth

(b) Retraction of intercostal spaces
(c) Excursion
(d) Chest elevation symmetry-flail chest
(e) Lacerations, puncture, or ecchymosis

(2) Palpate
(a) Vertebrae and ribs for symmetry and tenderness
(b) Anterior to posterior compression of thorax
(c) Lateral-to-lateral compression of thorax
(d) Clavicle
(e) Costochondral junction

(3) Auscultate for lung and heart sounds
(a) Lung sounds
(i) Absent or unequal breath
(ii) Characteristics
* Crackles – a common abnormal respiratory sound heard on auscultation of the chest during inspiration. Sounds like shuffling of paper.
* Rhonchi – abnormal sounds heard on auscultation of an airway obstructed by thick secretions, muscular spasm, neoplasm, or external pressure.
* Wheezes – A form of rhonchus, characterized by a high-pitched or low-pitched musical quality.
* Stridor – abnormal high pitch musical sound caused by an obstruction in the trachea or larynx (Best heard in neck region).

(b) Heart sounds – a normal noise produced within the heart during the cardiac cycle that can be heard over the pericardium. It may reveal abnormalities in cardiac structure or function. Cardiac auscultation is performed systematically from apex to base of the heart, using a stethoscope to listen. Listen for the following:
(i) Rate
(ii) Rhythm
(iii) S1 – The first heart sound in the cardiac cycle, occurring at the outset of ventricular systole. A dull and prolonged „lub“.
(iv) S2 – The second heart sound in the cardiac cycle. It is associated with closure of the aortic and pulmonic valves at the outset of ventricular diastole.
(v) Abnormal or skipped beats

(4) Percussion
(a) Fluid in thorax

(b) Pneumothorax or collapsed lung – collection of air or gas in the pleura spaces causing the lung to collapse. May be the result of:
  (i) An open chest wound that permits the entrance of air
  (ii) The rupture of an emphysematous Bleb on the surface of the lung
  (iii) Severe bout of coughing
  (iv) May occur spontaneously without apparent cause

Back - Inspect for
(1) Deformities
(2) Contusions
(3) Abrasions
(4) Punctures/penetrations/exit wounds
(5) Burns
(6) Tenderness
(7) Lacerations
(8) Swelling

Abdomen
(1) Inspect for
  (a) Lacerations, ecchymosis, burns, etc.
  (b) Hematoma
  (c) Flexion of hips to relieve pain
  (d) Wound
(2) Auscultate bowel sounds
(3) Palpate firmly for
  (a) Distended abdomen
  (b) Guarding
  (c) Local tenderness
  (d) Rebound pain
  (e) Rigidity

Pelvis
(1) Inspect for
  (a) Stable or not stable
  (b) Fracture
    (i) Could be a source of major hemorrhage

Extremities
(1) Inspect for
  (a) Deformities or abnormal angulation or bone ends protruding
  (b) Contusion
  (c) Abrasions
  (d) Punctures, needle marks or bites
  (e) Bruising
  (f) Tenderness
  (g) Lacerations or ecchymosis

(h) Swelling

(2) Assess

(a) Inability to move joint

(b) Presence of extremity pulse

(i) Dorsalis pedis

(ii) Radial

(c) Nail bed color (cyanosis)

(d) Impaired sensation

(e) Pain

Central nervous system

(1) Inspect for

(a) Absent reflexes, paralysis

(b) Loss of bowel or bladder

TERMINAL LEARNING OBJECTIVE

Given a fully stocked M5 Bag or Combat Medic Vest System, oxygen and portable suctioning device secure an open airway and ensure casualty's ventilation/oxygenation IAW cited references.

Establish an airway

Perform manual maneuvers

(1) Head-tilt, chin-lift
- (a) Once casualty is in supine position, place one hand on forehead and place fingertips of other hand under bony area at center of casualty's lower jaw
- (b) Tilt head by applying gentle pressure to casualty's forehead
- (c) Use fingertips to lift chin and to support lower jaw. Move jaw forward to point where lower teeth are almost touching upper teeth.
- (d) Do NOT allow casualty's mouth the be closed

(2) Jaw-thrust
- (a) Keep casualty's head, neck, and spine aligned
- (b) Take position at top of casualty's head resting your e bows on same surface the casualty is lying on
- (c) Reach forward and gently place on hand on each side of casualty's lower jaw, at the angles of the jaw below the ears
- (d) Stabilize casualty's head with forearms
- (e) Using index fingers, push angles of casualty's lower jaw forward
- (f) You may need to retract the casualty's lower lip with your thumb to keep the mouth open
- (g) Do NOT tilt or rotate the casualty's head

Insert nasal airway adjunct

NOTE: Do not use the nasopharyngeal airway if you see the roof of the mouth is fractured or brain matter is exposed. The airway may enter the cranial cavity.

(1) Purpose-to maintain an artificial airway for oxygen therapy or airway management when suctioning is necessary

(2) Indications-when oropharyngeal airway cannot be used
- (a) Casualty is conscious, semi-conscious, or has a gag reflex
- (b) Casualty has injuries to mouth (e.g. broken teeth, massive oral tissue damage)
- (c) Seizure casualties who may have clenched teeth due to seizing
- (d) When vomiting is likely to occur

(3) Complications

(a) Possible complication resulting from device is nasal trauma

(b) Some casualties, a nasal airway will trigger gag reflex: Do NOT use nasopharyngeal airway if there is evidence of head injury or if drainage of cerebrospinal fluid (CSF) from nose, mouth, or ears is present. CSF may indicate a skull fracture and the airway might enter the cranial cavity. Follow SOPs.

(4) Nasopharyngeal insertion procedures

(a) Place the casualty on a firm surface in the supine position with C-spine stabilized

(b) Select proper size nasopharyngeal airway

(i) Diameter-select an airway with a diameter smaller than the casualty's nostril or one that is approximately the diameter of the casualty's little finger

(ii) Length-measure from tip of patient's nose to ear lobe

(c) Lubricate airway with a water soluble lubricant or sterile water if lubricant is not available

(d) Push tip of nose slightly up to expose opening in nostril

(e) Keeping the head in a neutral position, insert tip of airway through nostril

(f) Slowly advance tube along floor of nasal cavity until flange rest firmly against casualty's nostril

(i) If resistance is met during insertion, DO NOT continue

(ii) Stop, remove adjunct, relubricate and try other nostril

(iii) If resistance is still met, check proper size or use alternate artificial airway method

(g) Administer oxygen therapy and ventilate casualty at this time if necessary. Follow local protocol

(h) To remove the airway, pull out with a steady motion along the curvature of the nasal cavity

Insert oral airway adjunct

(1) Purpose

(a) To hold the tongue away from the back of the throat, thereby preventing an airway obstruction (in a person without gag reflex)

(b) Also allows for drainage and/or suction of secretions to prevent aspiration

(2) Indication-utilized for the unconscious patient without a gag reflex

(3) Complications

(a) Induces vomiting and aspiration when gag reflex is present

(b) Airway obstruction from tongue may occur with improper placement: If the oropharyngeal airway is inserted into a patient with a gag reflex, vomiting or spasms of the vocal cords may occur, causing airway obstruction.

(4) Oropharyngeal insertion procedures
- (a) Place patient on a flat surface in a supine position
  - (i) Non-trauma patient-use head-tilt, chin-lift method
  - (ii) Trauma patient-minimize neck movement using jaw-thrust maneuver
- (b) Maintain airway by utilizing manual techniques and/or mechanical devices (e.g., head-tilt, chin-lift, jaw thrust airway adjuncts)
- (c) Select the proper size airway by measuring from the earlobe to the corner of the mouth or from the center of the casualty's mouth to the angle of the lower jaw bone
- (d) With non-dominant hand, use the cross-finger technique to open the patient's mouth
- (e) Visualize inside the mouth, and suction if necessary: Do NOT use the oropharyngeal airway if you see that the roof of the mouth is fractured or brain matter is exposed. The airway may enter the cranial cavity.
- (f) Holding the adjunct in the dominant hand, position the correct size airway so that the tip is pointing toward the roof of the casualty's mouth
- (g) Insert airway into casualty's mouth by sliding tip along the roof past the uvula or until resistance is met by the soft palate
- (h) Gently rotate the airway 180 degrees, so tip is positioned behind back of tongue
- (i) The flange of the airway should rest against the casualty's lips
- (j) If J-tube is too large for casualty, more than a 1/4 of length protruding from lips, remove and choose proper size to prevent occlusion of airway.
- (k) Administer oxygen, ventilate as necessary, IAW SOPs
- (l) Monitor casualty closely. If the casualty gags or regains consciousness, remove the airway immediately
- (m) Remove airway by pulling out with the natural curvature of the mouth, **DO NOT** rotate
- (n) Vomiting may occur with airway removed; have suction device ready when removing airway adjunct.

Consider cricothyroidostomy

NOTE: This section is for familiarization only. The medic **will not** perform this procedure.

(1) Casualty preparation
- (a) Place casualty in a supine position
- (b) Slightly hyperextend the casualty's neck (If suspected cervical injury do not hyperextend neck).
- (c) Place blankets under casualty's neck or between shoulder blades so the airway is straight.

(2) Assemble and prepare equipment and supplies
- (a) Scalpel/scalpel handle/knife
- (b) Suctioning device, if available
- (c) Hemostats
- (d) Needle holders
- (e) Cannula (non-collapsible tube to maintain airway)
- (f) Blanket
- (g) Gloves
- (h) Tape
- (i) Establish a sterile field

(3) Overview of procedure

NOTE: This procedure is performed by MD/PA. The medic should not attempt to perform.

- (a) Position the casualty for procedure (supine position). Strict surgical aseptic technique is followed during procedure.
- (b) Surgically prepare the area and assist the MD/PA in anesthetizing the area locally, if the patient is conscious/time permits
- (c) Assist MD/PA in locating the cricothyroid membrane.
- (d) Assist the MD/PA in stabilizing the trachea to prevent lateral movement of the trachea during the procedure
- (e) Provide the MD/PA the cannula and assist as necessary with insertion. Cannula may be a cuffed endotracheal tube of appropriate size or tracheostomy tube. Inflate the cuff of the tube and ventilate patient.
- (f) Provide supplemental oxygen
- (g) Secure the cannula in place to reduce movement in the opening and to prevent inhalation of the cannula.
- (h) Suction and or assist the MD/PA in suctioning the casualty's airway, as necessary.
  - (i) Insert the suction catheter 4 to 5 inches into the cannula
  - (ii) Apply suction only when withdrawing the catheter.
  - (iii) Administer 1 cc of saline solution into the airway to loosen secretions and help facilitate suctioning, if indicted
  - (iv) When directed by MD/PA, apply a sterile dressing under the casualty's cannula and make a Y-shape fold in a 4X4 gauze pad and place under the edge of the cannula to prevent irritation to the incision.

(5) Assist with on-going patient assessment/management
- (a) Continue to monitor vital signs to include pulse oximetry, if available.
- (b) Assist with ventilation as necessary.
- (c) Monitor for complications associated with the procedure

(i) Aspiration
(ii) Asphyxia
(iii) Laceration of the esophagus/trachea
(iv) Mediastinal emphysema
(v) Hemorrhage/hematoma formation

Consider chest needle decompression

(1) Indications - This procedure is applicable to the rapidly deteriorating casualty with a life threatening tension pneumothorax with decompression as evidenced by
  (a) Respiratory distress and cyanosis
  (b) Decreasing level of consciousness
(2) Materials required to perform the procedure
  (a) A minimum of a 2 inch, 12 to 14 gauge I.V. needle with catheter
  (b) Betadine or alcohol prep pads
  (c) Surgical gloves
(3) Review anatomy of the chest and identify the following anatomical landmarks on the side of the tension pneumothorax
  (a) Mid-Clavicular line
  (b) Second Intercostal space - superior edge of the 3rd rib
(4) Steps for performing the procedure
  (a) Position of Casualty: this procedure is not dependant on any single position that the casualty may be in or able to be moved to. Casualty may be lying flat, sitting etc
  (b) Site preparation: Preparation of the site is accomplished using either alcohol and or betadine prep pads to disinfect the skin
  (c) Using your index finger trace the mid clavicular line, then Identify the second intercostal space (between the second and third r bs) on the side of the tension pneumothorax
  (d) Insert the needle perpendicular to the chest wall, directly over the top of the third r b until a palpable pop is felt followed immediately by a hissing of air escaping from the chest cavity
  (e) A rush of air confirms the diagnosis and rapidly improves the patient's condition
(5) Complications
  (a) Laceration of the intercostal vessels my cause hemorrhage. The intercostal artery and vein run around the inferior margin of each rib. Poor needle placement can lacerate one of these vessels
  (b) Creation of a pneumothorax may occur if not already present. If your assessment was incorrect you may create a pneumothorax when you insert the needle into the chest
  (c) Risk of infection is a consideration. Adequate skin preparation with an antiseptic will usually prevent this
  (d) Intercostal nerve/artery injury is poss ble if the needle is placed beneath the rib accidentally

(e) A tube thoracostomy should be accomplished by a PA/MD ASAP as the needle may be inadequate to continuously decompress the chest if a major bronchus is ruptured

Review concepts of airway management

Objective of airway maintenance

(1) Immediately establish and maintain a patent airway
(2) Determine whether casualty is breathing
(3) Consider artificial ventilation

Identify neglected prehospital skills related to airway

(1) Need for oxygen and artificial ventilation
(2) Properly establishing and maintaining an open airway

Review modified forms of respiration

(1) Coughing
  (a) Forceful exhalation of a large volume of air from lungs
  (b) Serves a protective function
(2) Sighing
  (a) Slow, deep inspiration followed by a prolonged expiration
  (b) Sighing hyperinflates lungs and re-expands atelectatic areas
(3) Grunting: indication of respiratory distress

Review terminology

(1) Hyperventilation - An increase in the number of resperations per minute above the normal range for a given age group.
(2) Hypoventilation - A decrease in the number of respirations per minute that falls below the normal range for a given age group.
(3) Compliance - the ability of the lungs and chest wall to expand and ventilate a patient, supports whether or not you can adequately ventilate.

Assess for respiratory obstruction

Type of respiratory obstruction

(1) Partial
  (a) Allows for either adequate or poor air exchange
  (b) Adequate exchange makes it possible for patient to cough effectively
  (c) Poor air exchange will no longer allow casualty to generate an effective cough
  (d) Often give off high-pitched noise while inhaling
  (e) May also experience increased breathing difficulty and cyanosis
(2) Complete
  (a) Airflow is neither felt nor heard from nose and mouth
  (b) Casualty cannot speak, breathe, or cough

(c) Casualty will become unconscious quickly
(d) Can be recognized by difficulty encountered when trying to ventilate the casualty

Source of respiratory obstruction

(1) Tongue
  (a) Most common cause of airway obstruction
  (b) In absence of sufficient muscle tone, the relaxed tongue falls back against rear of pharynx
  (c) Airway blockage by base of tongue depends on position of head and jaw
  (d) Can occur regardless of whether casualty is in lateral, supine, or prone position
(2) Foreign body: Largely, poorly chewed pieced of food can obstruct upper airway by becoming lodged in laryngopharynx
(3) Trauma/Combat
  (a) Airway may be obstructed by:
    (i) Loose teeth
    (ii) Facial bone fractures
    (iii) Tissue
    (iv) Clotted blood
    (v) Neck wound
  (b) Penetrating or blunt trauma may obstruct airway by fracturing or displacing larynx, allowing vocal cords to collapse into tracheal lumen
(4) Laryngeal spasm
  (a) Moderate amounts of edema can severely obstruct airflow through the glottis and result in asphyxia
  (b) Causes can include:
    (i) Anaphylaxis
    (ii) Epiglottis
    (iii) Inhalation of super-heated air, smoke, or toxic substances
(5) Aspiration
  (a) Dentures, teeth, and vomitus are likely to obstruct the airway
  (b) If allowed to enter the lungs, can result in increased interstitial fluid and pulmonary edema
  (c) Result can be severe damage to alveoli, thus causing hypoxemia
  (d) Can usually be avoided by proper airway management and suction
(6) Inadequate ventilation
  (a) A reduction of either rate or volume of inhalation leads to a reduction of either rate or volume of inhalation
  (b) Respiratory rate may be rapid, but depth of breathing is so shallow that little air exchange takes place
  (c) State of decreased ventilation may be brought on by:
    (i) Depressed respiratory function
    (ii) Fractured ribs

(iii) Drug overdose
(iv) Spinal injury
(v) Head injury

Provide emergency medical care

(1) Heimlich maneuver (Only if choking, not in trauma)
  (a) Stand behind casualty and wrap arms around waist
  (b) Place a fist thumb-side toward abdomen, midway between xiphisternal notch and navel
  (c) Grasp properly positioned fist with other hand and apply pressure inward and up toward casualty's head. Deliver five rapid thrusts
  (d) For unconscious casualty, place in supine position. Kneel and straddle casualty at level of thighs, facing chest.
(2) Finger sweep
  (a) Open mouth by grasping tongue and lower jaw together with one hand and lifting
  (b) Sweep a curved index finger from far side of mouth along the cheek, deeply into back of throat, and then out the near side
  (c) Do NOT extend finger straight into center of pharynx
(3) Chest thrusts (Only if choking, not in trauma)
  (a) Place hands in position for closed chest compression
  (b) Deliver 6-10 distinct thrusts in rapid succession
(4) Suctioning: To remove vomitus, blood, and other fluids and secretions from the airway

Provide oxygen if casualty is found not breathing

Apply mouth-to-mask (mouth-to-mouth) ventilation

(1) Position yourself at casualty's head and open the airway. If trauma is suspected, open using jaw-thrust technique.
(2) Connect oxygen to inlet on face mask. Oxygen should run at 15 liters per minute.
(3) Position mask on casualty's face so that apex is over bridge of nose and base is between lower lip and prominence of chin
(4) Hold mask firmly in place while maintaining the proper head tilt
(5) Take a deep breath and exhale into make port
(6) Remove mouth from port and allow for passive exhalation

Apply one person bag-valve-mask

(1) Position yourself at casualty's head and establish an open airway. If trauma is suspected, open using jaw-thrust technique.
(2) Select correct size mask
(3) Form a "C" around ventilation port with thumb and index finger
(4) With other hand, squeeze bag once every 5 seconds
(5) Release pressure on bag and let casualty exhale passively
(6) Observe for gastric distension, changes in compliance of bag with ventilation, improvement or deterioration of ventilation status

Apply two person bag-valve-mask: noninvasive

(1) Open casualty's airway using jaw thrust technique (if trauma is suspected)
(2) Select correct bag-valve mask size
(3) Kneel at patient's head. Place thumbs over nose portion of mask and place you index and middle fingers over portion of mask that covers the mouth.
(4) Use your ring and little fingers to bring the jaw upward, toward the mask.
(5) Second rescuer should squeeze the bag once every 5 seconds (with two hand techinique) to ventilate the casualty

Suction the airway

NOTE: The first opportunity for suctioning will be in the field ambulance (FLA). (In relation to only on the battlefield)

Purpose-to keep airway clear of all foreign matter (e.g., blood, saliva, vomitus, debris) which could be aspirated into the trachea or the lungs

Indications

(1) Casualties that have a decreased level of consciousness and are unable to clear their own airway
(2) Casualties who cannot clear airway because of excessive amounts of foreign matter

Suction Steps and Procedures

(1) Preoxygenate the casualty for 1 to 2 minutes to increase the oxygen saturation in the blood. This reduces the risk of causing hypoxemia.
(2) Position casualty
  (a) Non-trauma/conscious casualty--position yourself at the casualty's head and turn casualty's head to the side
  (b) Trauma/unconscious casualty--position yourself at the casualty's head and maintain spinal alignment while log rolling casualty towards you
(3) Select and measure the suction catheter
  (a) Flexible suction catheter
    (i) Sterile tube used for oropharyngeal or nasopharyngeal suctioning of fluids of small foreign particles
    (ii) Sized in French (Fr.) guage
  (b) Yankaeur suction tip (tonsil tip)
    (i) Used for oral suction only
    (ii) Not necessary to measure, just keep sight of the tip when inserting it
    (iii) Large-bore opening - preferred method of removing large particles of foreign material
    (iv) Only one size
  (c) Consider route
    (i) Oral
    (ii) Nasopharyngeal
    (iii) Nasotracheal
(4) Check suction unit and equipment
  (a) Ensure power source is available and unit is functioning before beginning the procedure
  (b) Cover the proximal port with your thumb and set the suction vacuum at 100-120 mmHg for an adult or child, and 60-100 mmHg for an infant
  (c) Release your thumb from the port before inserting it, do not suction on the way in

Perform oropharyngeal suctioning

(1) Open casualty's mouth using the crossed finger technique and clear the mouth of any visible fluids or obstructions with gloved finger
(2) Suction apparatus placement
  (a) Suction tip--insert with the convex (bulging out) side against the roof of the mouth and stop at the beginning of the pharynx
  (b) Suction catheter--insert the catheter up to the base of the tongue
  (c) Cover proximal port to begin suctioning
  (d) Suction as you slowly withdraw, moving the tip from side to side
  (e) Suction for **15 seconds** or **less**
  (f) Reoxygenate casualty after suctioning IAW local SOPs
  (g) Observe casualty for:
    (i) Hypoxemia
    (ii) Color change
    (iii) Increased or decreased pulse rate
    (iv) Change in breath

Combitube Intubation

Complications

(1) An increased incidence of sore throat, dysphagia and upper airway hematoma when compared to endotracheal intubation and LMA.
(2) Esophageal rupture is a rare complication but has been described.
(3) Complications may be partially preventable by avoiding over-inflation of the distal and proximal cuffs
(4) Compared to intubation with an endotracheal tube under direct laryngoscopy or using the LMA, the Combitube seems to exert a more pronounced hemodynamic stress.

Contra-indication

(1) Known esophageal disease

Preparation

(1) Test both cuffs for leaks
  (a) The pilot balloon of the distal cuff is white and is marked with the number 2
  (b) Test the distal cuff by inflating with 15 ml of air
  (c) The pilot balloon of the proximal cuff is blue and is marked with the number 1
  (d) Test the proximal cuff by inflating with 85 ml of air

Sizes Of Combitube

41 Fr	for patients taller than 5ft (152 cm)
37 Fr	patients shorter than 5ft (152 cm)

(1) The bulky design of the 41 Fr can make it more technically difficult to insert
(2) Satisfactory results using the 37 Fr Combitube on taller patients.

Oral Intubation

(1) The combitube can be inserted blindly without the aid of a laryngoscope
(2) Use of a laryngoscope has been reported to facilitate placement of the Combitube,
(3) The laryngoscope aids insertion by forcefully creating a greater space in the hypopharynx.
(4) Induce patient as if for regular intubation.
(5) Patient head position can be neutral.
(6) When direct laryngoscopy is attempted and the vocal cords can be visualized, the Combitube should be placed in the trachea and used as a regular endotracheal tube.
    (a) Inflate the distal cuff with just enough air until no leak is present.
    (b) Check for bilateral breath sounds over the lungs and confirm endotracheal placement on the capnogram.
    (c) Connect the breathing circuit to the white connector number 2.
(7) If the Combitube is placed blindly, the left hand should elevate the chin while the right hand maneuvers the Combitube.
(8) More space can be created in the hypopharynx by using a laryngoscope with the left hand.
(9) The Combitube should be inserted to such a depth that the upper incisors are between the two black guidelines on the external surface of the tube:
    (a) Inflate the distal cuff with 12 ml.
    (b) Ventilate through the white connector number 2 and listen for gurgling sounds over the epigastrium or breath sounds over the lungs. If breath sounds are heard over the lungs the Combitube has been placed in the trachea and can be used as a regular ETT as descr bed above after confirmation on the capnogram. If gurgling sounds are heard over the epigastrium, the Combitube is located in the esophagus.
    (c) Inflate the proximal cuff with just enough air until either no leak is present or a subjective sensation of increased resistance to cuff inflation is encountered. This is usually achieved by inflating with 50-75 ml of air. This is less than the 85 ml recommended by the manufacturer but has been found to cause less upper airway trauma (1)
    (d) Ventilate through the blue connector number 1, listen for breath sounds over the lungs and confirm ventilation on the capnogram.

Troubleshooting Tips

(1) Unable to ventilate patient through blue connector number 1

(a) Make sure the Combitube is not per chance in the trachea.
(b) Attempt to ventilate through connector number 2, if breath sounds are heard over the lungs then the combitube has been placed in the trachea instead of the esophagus.
(c) Deflate the large proximal pharyngeal cuff and use the Combitube as a regular ETT.

(1) Unable to ventilate patient through either connector
(a) Confirm that the combitube has been placed in the esophagus by listening for epigastric gurgling sounds while ventilating through connector number 2.
(b) Withdraw the combitube 2-3 cm at a time while ventilating through connector number 1 until breath sounds are heard over the lungs.
(c) The most common cause of this inability to ventilate to ventilate through either connector is an excessive insertion depth of the combitube (relative to the patient).
(d) This will cause obstruction of the glottic opening by the large proximal pharyngeal cuff.

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked M5 Bag or Combat Medic Vest System, IV administration equipment and fluids, selected medications, and documentation forms. You encounter a casualty who presents with external or internal bleeding. The casualty has been initially assessed and injury(ies) prioritized. IAW *Emergency Care in the Streets*, FM 21-11, and *Emergency Medicine*.

Identify external bleeding

Body substance isolation must be routinely taken to avoid skin and mucous membrane exposure to body fluids

(1) In a tactical situation, your only line of defense may be gloves.
(2) Additional BSI equipment could include:
  (a) Eye protection
  (b) Masks
  (c) Hand washing following each run

Severity
(1) Dependent upon amount of blood lost in relation to physical size of casualty
(2) Sudden loss of 1 liter (1000 cc) of blood is considered serious
(3) May also depend on casualty's condition - look for signs and symptoms of shock

Types of bleeding
(1) Arterial
  (a) Often rapid, profuse and pulsating
  (b) Usually bright red in color because it is rich in oxygen
(2) Venous
  (a) Steady flow
  (b) Usually dark red or maroon in color
(3) Capillary
  (a) Slow and oozing
  (b) Often clots spontaneously

Provide emergency medical care

(1) Direct Pressure:
(2) Quickest method to control bleeding. Bleeding is controlled by applying pressure directly to the wound
  (a) Place a sterile dressing on the wound
  (b) Tie a knot with the sterile dressing or adhere tape directly over the wound
  (c) Only tight enough to control bleeding

(i) If bleeding is not controlled, apply another dressing over the first or apply direct pressure with your hand or fingers over the wound
(ii) Direct pressure can be applied by the casualty or a bystander

(3) Elevation to control bleeding

(a) Raising (elevation) of an injured arm or leg extremity, above the level of the heart
(b) Elevation should be used together with direct pressure
(c) Do not elevate an extremity if you suspect a broken bone (fracture) until it has been properly splinted and you are certain that elevation will not cause further injury
(d) Use a stable object to maintain elevation, such as a ruck sack. Placing an extremity on an unstable object may cause further injury

(4) Pressure Points: Used In cases of severe bleeding when direct pressure and elevation are not controlling the bleeding

(a) Bleeding from an artery can be controlled by applying pressure to the appropriate pressure point
(b) Pressure point
(i) Areas of the body where the blood flow can be controlled by pressing the artery against an underlying bone
(ii) Pressure is applied with the fingers, thumb, or heel of the hand.
(c) Pressure points most often used
(i) Arm (brachial)
* Used to control severe bleeding of the lower part of the upper arm and elbow
* Located above the e bow on the inside of the arm in the groove between the muscles
* Using your fingers or thumb, apply pressure to the inside of the arm over the bone
(ii) Groin (femoral)
* Used to control severe bleeding of the thigh and lower leg
* Located on the front, center part of the crease in the groin
(d) Application of pressure points
(i) Position the casualty on his or her back, kneel on the opposite side from the wounded leg, place the heel of your hand directly on the pressure point, and lean forward to apply pressure
(ii) If the bleeding is not controlled, it may be necessary to press directly over the artery with the flat surface of the fingertips and to apply

additional pressure on the fingertips with the heel of your other hand

(5) Splints

(a) Immobilization is one of the best ways to stop bleeding

(c) Broken bone fragments may continue to grate on blood vessels and increase bleeding if they are not immobilized

(d) Muscular activity can also increase the rate of blood flow

(e) Air splints may be used to apply direct pressure over an extremity

(f) Splinting using an air splint gives a double benefit – splinting and direct pressure

(6) Tourniquet

(a) Used only as a last resort to control severe bleeding after all other methods have failed and is used only on the extremities

(b) Before use, you must thoroughly understand its dangers and limitations. Tourniquets cause tissue damage and loss of extremities when used by untrained individuals. Tourniquets are rarely required and should only be used when an arm or leg has been partially or completely severed and when bleeding is uncontrollable.

(c) The standard tourniquet

(i) Normally a piece of cloth folded until it is 3 or more inches wide

(ii) 6 or 7 layers thick

(iii) Can be a strap, belt, neckerchief, towel, or other similar item.

(iv) Folded triangular bandage makes a great tourniquet

(v) Never use wire, cord, or any material that will cut the skin.

(d) Apply a tourniquet

(i) While maintaining the proper pressure point, place the tourniquet between the heart and the wound, leaving at least 2 inches of uninjured skin between the tourniquet and wound

(ii) Place a pad (roll) over the artery to be compressed

(iii) Wrap the tourniquet around the extremity twice, and tie a half-knot on the upper surface

(iv) Place a short stick or similar object on the half-knot, and tie a square knot

(v) Twist the stick to tighten, **UNTIL BLEEDING STOPS AND NO FURTHER**

(vi) Secure the stick in place

(vii) Never cover a tourniquet

(viii) Using a marker, make a 'T" on the casualty's forehead and the time and date tourniquet was applied

(ix) Never loosen or remove a tourniquet once it has been applied. The loosening of a tourniquet may dislodge clots and result in enough blood loss to cause shock and death

(7) Dress the stump (in case of amputation)

(a) Apply dressing to cover the end of the stump
(b) Often, blood vessels collapse or retract
(c) Control bleeding by direct pressure, pressure dressing and/or tourniquet (as required or necessary)
(d) When possible, wrap the amputated part in a sterile dressing
(e) Preservation of Amputated Parts
(i) Rinse the amputated part free of debris with cool, sterile saline
(ii) Wrap the part loosely in saline-moistened sterile gauze
(iii) Seal the amputated part inside a plastic bag, and place it in a cool container. Keep cool, but do not allow it to freeze
(iv) Never warm an amputated part
(v) Never place an amputated part in water
(vi) Never place an amputated part directly on ice
(vii) Never use dry ice to cool an amputated part

(8) Continually reassess the casualty to include all vital signs

Identify internal bleeding

Severity

(1) Internal bleeding can result in severe blood loss with resultant shock (hypoperfusion) and subsequent death
(2) Injured or damaged internal organs commonly lead to extensive bleeding that is concealed
(3) Traumatized painful, swollen, and deformed extremities, or long bone fractures may also lead to serious internal blood loss
(4) Suspicion and severity of internal bleeding should be based on mechanism of injury
(5) Although not usually visible, can result in serious blood loss. A casualty with internal bleeding can develop shock before you realize the extent of their injuries.

Mechanism of injury

(1) Falls
(2) Blast injures
(3) Penetrating trauma
(a) Gunshot wounds
(b) Stab wounds
(c) Impaled objects

Signs and symptoms - assessment findings of internal bleeding

(1) Bruise indicates bleeding into the skin (soft tissues)

(2) Severe internal bleeding occurs in injuries caused by a violent force (blunt injury), puncture wounds (knife), and broken bones

(3) Signs of internal bleeding include: (Steps 1 – 6 are the same as shock so there should be a strong suspicion of shock)
- (i) Anxiety and restlessness
- (ii) Excessive thirst (polydipsia)
- (iii) Nausea and vomiting
- (iv) Cool, moist, and pale skin (cold and clammy caused by lack of circulation to skin)
- (v) Rapid breathing (tachypnea)
- (vi) Rapid, weak pulse (tachycardia)
- (vii) Bruising or discoloration at site of injury (contusion)
- (viii) Tenderness or rigidity of abdomen

(4) Severe internal bleeding
- (i) Notify MD/PA
- (ii) Rapid Transport
- (iii) Monitor airway, breathing, and circulation (ABCs)
- (iv) Treat for shock
- (v) Administer oxygen, if available
- (vi) Place casualty in most comfortable position
- (vii) Maintain normal body temperature

(5) Nosebleed (epistaxis) can be caused by an injury, disease, the environment, high blood pressure, and changes in altitude
- (i) Nosebleeds frighten the casualty and may bleed enough to cause shock
- (ii) Cover the nose with a loose, dry, sterile dressing and notify the MD/PA
- (iii) Keep the casualty quiet, sitting with head tilted forward
- (iv) Put pressure on the upper lip just below the nose
- (v) Inform the casualty not to rub, blow, or pick their nose
- (vi) Seek MD/PA assistance if the nosebleed continues, bleeding starts again, or bleeding is because of high blood pressure
- (vii) If the casualty loses consciousness, place them on their side to allow blood to drain from the nose and call the MD/PA

Provide emergency medical care

(1) Casualties with severe external bleeding and suspected internal bleeding must be seen by MD/PA as soon as possible and evacuated

(2) All casualties with external and internal bleeding should be treated for shock. Includes IV fluids to maintain peripheral perfusion.

(3) Maintain airway - provide artificial ventilation

(4) Continue reassessments, pulse oximetry, if available

Review of dressings and bandages

Dressing

Any materials applied to a wound in an effort to control bleeding and prevent further contamination.
Dressings should be sterile.

Bandage

Any material used to hold a dressing/or splint in place.
Bandages should be clean but may not be sterile.

Three basic rules to dressing application:

(1) Use sterile materials
(2) Cover the entire wound
(3) Control bleeding

Four basic rules to bandaging:

(1) Do not bandage too tightly
(2) Do not bandage too loosely
(3) Do not leave loose ends
(4) Do not cover tips of fingers, mouth, nose and toes

Types of dressings and bandages

(1) Dressings:
    (a) Gauze pads (4x4's etc...)
    (b) Roller gauze (various sizes)
(2) Bandages:
    (a) Roller gauze
    (b) Elastic Roller gauze (ice wraps)
    (c) Triangular (cravats)
(3) Combo dressings/bandages:
    (a) Field dressing/Abdominal dressing
    (b) Adhesive bandages (band-aids = various sizes)

TERMINAL LEARNING OBJECTIVE

Given a stocked M5 Bag or Combat Medic Vest System, IV administration equipment and fluids, oxygen, suction and ventilation equipment (if available), selected medications, and documentation forms. Given a casualty who is exhibiting signs and symptoms of shocks. Other life threatening injury(ies) is/are identified and treated. IAW *Emergency War Surgery*, *Emergency Medicine*, and *Basic Trauma Life Support*.

Definition of shock

Shock is a state of inadequate tissue perfusion resulting in decreased amount of oxygen to vital tissues and organs leading to reduced removal of waste products of metabolism

Causes of shock

(1) Heart attack
(2) Severe or sudden blood loss from an injury or serious illness
(3) Large drop in body fluids, such as following a severe burn or severe vomiting and/or diarrhea
(4) Blood poisoning from major infections
(5) Exposure to extreme heat or cold for too long

Hypovolemic shock

(1) Hemorrhage is the most common cause of hypovolemic shock after injury
(2) Volume of fluid is reduced because of loss of blood, plasma, or body fluids or volume of vascular system has increased (vasodilation)
(3) Adequate circulation cannot be maintained to all parts of the body
(4) Can be caused by:
    (a) Severe burns
    (b) Protracted vomiting and diarrhea
    (c) Hemorrhage
(5) Internal or external hemorrhage due to trauma such as crush injuries (hemorrhagic shock) - loss of whole blood
(6) Clinical signs of acute hemorrhagic shock include:

% Blood loss	Clinical Signs
< 15	Slightly increased heart rate, Local swelling, bleeding
15-25	Increased heart rate, Increased diastolic blood pressure, prolonged capillary refill
25-50	Above findings plus: hypotension, confusion, acidosis, decreased urine output
> 50	Refractory hypotension, refractory acidosis, death

(7) Other common signs:
    (a) Progressive fall in systolic and diastolic blood pressure
        (i) Organ blood flow and tissue perfusion are the critical determinants

(ii) Systolic blood pressure 80mmHg or below can indicate shock for normotensive patients
(iii) Any fall in systolic blood pressure below 100mmHg or any fall of 20mmHg or more below patient's usual systolic blood pressure must be brought to the attention of the physician
(iv) In early stages of shock, blood pressure may not fall because of body's attempt to compensate

(b) Skin is cold, clammy and pale, caused by:
(i) Constriction of peripheral blood vessels (cold)
(ii) Activation of sweat glands (clammy)
(iii) Ischemia of the cells (pale)

(c) Cyanosis
(i) Nail beds, lips, and ear lobes
(ii) Lack of cyanosis may not prove absence of hypoxia

(d) Rapid, weak, thready pulse
(i) Rapid heart rate is a compensatory mechanism to increase cardiac output
(ii) Narrow pulse pressure due to fall in systolic blood pressure and rise in diastolic blood pressure causes weak and thready pulse
(iii) In later stages, pulse may be imperceptible

(e) Shallow, rapid breathing, and grunting may be heard
(i) Air hunger evident in earlier stages
(iii) Rate decreases in profound shock

(f) Subnormal temperature due to depressed heat regulating mechanism (except in bacteremic shock)

(g) Oliguria - caused by vasoconstriction associated with diminished cardiac output resulting in a reduction in renal blood flow

(h) Listlessness, stupor, and loss of consciousness as condition deteriorates

Non-hemorrhagic shock

(1) Cardiogenic shock

(a) A decrease in the contractions/contractile ability of the myocardium. Heart fails to circulate blood efficiently to the tissues. From MI etc.

(b) A reduction in cardiac output results in:
(i) Decreased circulating blood supply
(ii) Decreased oxygen delivery

(c) Assess for blunt trauma to the chest. Can be caused by:
(i) Cardiac tamponade
(ii) Cardiac dysrhythmias
(iii) Myocardial infarction
(iv) Cardiac contusions

(d) Also assess for:
(i) Tachycardia

(ii) Muffled heart sounds
(iii) Engorged neck veins with hypotension
(iv) Dyspnea
(v) Edema in feet and ankles

(2) Septic shock

(a) Overwhelming bacterial infection
(i) Result of vasodilation of small blood vessels in wound area
(ii) General vasodilation if infection has entered the bloodstream
(b) Major cause - endotoxin release by these microorganisms
(c) Most common cause - gram negative organisms
(d) Common conditions that predispose to sepsis
(i) Diabetes
(ii) Cirrhosis
(iii) Post partum
(iv) Post abortion infections
(e) Septic shock usually does not develop for 2 to 5 days after an injury and the medic will not often see it in a first aid situation
(f) This type of shock carries a poor prognosis and must always be treated under the direct supervision of a medical officer.
(g) The medic should assess for:
(i) Penetrating abdominal injuries
(ii) Signs of infection
(iii) Warm pink skin and dry elevated body temperature
(iv) Tachycardia
(v) Wide pulse pressures

(3) Neurogenic shock

(a) Insult to the nervous system which leads to decreased arterial resistance
(b) Vasodilation -- as result of loss of sympathetic nervous system control over the size of the arterioles
(c) Can be caused by:
(i) Spinal cord injury
(ii) Certain drugs
(iii) Brain stem, spinal or torso trauma
(d) Signs and Symptoms:
(i) Hypotension without tachycardia
(ii) Warm pink skin
(iii) Low blood pressure

(4) Anaphylactic shock/Vasogenic shock

(a) Diffuse vasodilation results in an increase in the size of the vascular bed
(b) Blood is trapped in small vessels and in viscera and is temporarily lost to total circulatory volume
(c) Sudden severe allergic reaction to:
(i) Drug

(ii) Foreign substance
(iii) Toxin
(iv) Insect stings (i.e. wasps, bees, hornets, ants, yellow jackets)
(v) Food
(vi) Animal serum
(vii) Plants (i.e. poison oak, poison ivy and sumae)

(d) Onset usually begins within 30 minutes after exposure to causative factor
(i) Reaction usually progresses in explosive manner
(ii) Peak intensity within 1 hour

(e) Primary anaphylactic shock organs - Respiratory and cardiovascular events account for a majority of mortality associated with anaphylaxis.
(i) Cardiovascular
(ii) Respiratory
(iii) Cutaneous
(iv) Gastrointestinal
(v) Circulatory

(f) Symptoms
(i) Apprehension and flushing
(ii) Tightness in chest or difficulty breathing due to bronchi constriction
(iii) Wheezing or shortness of breath
(iv) Rapid, weak pulse
(v) Cyanosis
(vi) Generalized itching or burning
(vi) Sneezing or coughing
(viii) Watering and itching of the eyes
(ix) Hives
(x) Blood pressure drops, dizziness/faintness, swelling/edema, especially of face, tongue
(xi) Coma

(g) Consider an epinephrine injection, if indicated and authorized under protocol

Severity of Shock

(1) Compensated shock
(a) First stage
(b) Normal body defense mechanisms maintain perfusion and function

(2) Decompensated shock
(a) Second stage
(b) Blood shunted from less to more vital organs

(3) Irreversible shock
(a) Third and final stage
(b) Multiple system organ damage
(c) Even with treatment, death is the result

Assess for shock

Determine history of shock

(1) Is there internal or external hemorrhage underling cardiac problems sepsis trauma to spine cord, drugs or other sensitize substance contact?
(2) Determine amount of blood loss
(3) Determine how long casualty has been bleeding

Determine level of consciousness. Report and record, using AVPU:

(1) Alert
(2) Verbal response to stimuli
(3) Pain response to stimuli
(4) Unresponsive to any stimuli

Early Signs of shock include:

(1) Soldier must have high index of suspicion
(2) Minimum tachycardia
(3) No measurable changes occur in blood pressure, pulse pressure or respiratory rate

Other common signs:

(1) Decrease in systolic and increase in diastolic resulting in narrow pulse pressure
    (a) Organ blood flow and tissue perfusion are the critical determinants
    (b) Systolic blood pressure 80mmHg or below can indicate shock for normotensive patients
    (c) Any fall in systolic blood pressure below 100mmHg or any fall of 20mmHg or more below patient's usual systolic blood pressure must be brought to the attention of the physician
    (d) In early stages of shock, blood pressure may not fall because of body's attempt to compensate
(2) Skin is cold, clammy and pale, caused by:
    (a) Constriction of peripheral blood vessels (cold)
    (b) Activation of sweat glands (clammy)
    (c) Ischemia of the cells (pale)
(3) Cyanosis
    (a) Nail beds, lips, and ear lobes
    (b) Lack of cyanosis may not prove absence of hypoxia
(4) Rapid, weak, thready pulse
    (a) Rapid heart rate is a compensatory mechanism to increase cardiac output
    (b) Narrow pulse pressure due to fall in systolic blood pressure and rise in diastolic blood pressure causes weak and thready pulse
    (c) In later stages, pulse may be imperceptible
(5) Shallow, rapid breathing, and grunting may be heard
    (a) Air hunger evident in earlier stages

(b) Rate decreases in profound shock

(6) Subnormal temperature due to depressed heat regulating mechanism (except in septic shock)

(7) Oliguria - caused by vasoconstriction associated with diminished cardiac output resulting in a reduction in renal blood flow

(8) Listlessness, stupor, and loss of consciousness as condition deteriorates

Provide medical care

Treatment for Hypovolemic Shock

(1) The goal of treating shock is to increase tissue perfusion and oxygenation status. The treatment will vary according to type of shock.

(2) Maintain airway
- (a) Ensure open airway using head-tilt/chin-lift or jaw-thrust
- (b) Provide oxygen therapy once at BAS

(3) Control bleeding
- (a) Direct pressure
- (b) Elevation
- (c) Pressure points
- (d) Tourniquet if indicated

(4) Obtain baseline vital signs and level of consciousness

(5) Position casualty
- (a) On back with legs elevated 6 to 12 inches
- (b) Place casualty so that head is lower than the feet if possible (except in head injury)
- (c) If vomiting or bleeding around mouth, place on side or back with head turned to side (except in head injury)
- (d) If you suspect head or neck injuries, or are unsure of casualty's condition, keep them lying flat.

(6) Keep patient at normal temperature. Attempt to maintain normal body temperature, to prevent hypothermia and minimize effect of shock

(7) Fluid therapy
- (a) Intravenous fluid administration is the single most important factor in treatment of any type of shock except cardiogenic shock
- (b) Two 16 gauge IV's ACF Bilateral
- (c) Normal saline is adequate until properly cross-matched whole blood can be administered
  - (i) Replace lost blood volume
  - (ii) Replace lost extracellular fluid
- (d) All shock is severe, immediate administration of fluids is warranted. Delay transportation

(8) Drug therapy
- (a) To correct specific cardiac problems, only if ordered by MD

(9) Provide on-going assessment
- (a) Monitor level of consciousness
- (b) Monitor blood pressure

(c) Monitor heart rate
(d) Monitor respiratory rate
(e) Monitor vital signs
(f) Monitor skin response

Treatment for Septic Shock

(1) Securing the airway is the first priority
(2) Administer oxygen, if available
(3) Obtain baseline vital signs and level of consciousness
(4) Position casualty
  (a) On back with legs elevated 6 to 12 inches
  (b) Place casualty so that head is lower than the feet if possible (except in head injury)
  (c) If you suspect head or neck injuries, or are unsure of casualty's condition, keep them lying flat.
(5) Keep patient at normal temperature. Attempt to maintain normal body temperature, to prevent hypothermia and minimize effect of shock.
(6) Fluid therapy
  (a) Intravenous fluid administration is the second most important factor in treatment of any type of shock except cardiogenic shock
  (b) Two 16 gauge IV's ACF Bilateral
  (c) Normal saline is adequate until properly cross-matched whole blood can be administered
    (i) Replace lost blood volume
    (ii) Replace lost extracellular fluid
  (d) All shock is severe, immediate administration of fluids is warranted.
(7) Drug therapy
  (a) Dependent on source of infection
  (b) Administer empiric antibiotic as ordered by MD
(8) Provide on-going assessment
  (a) Perform serial neurological exams
  (b) Monitor blood pressure
  (c) Monitor heart rate
  (d) Monitor respiratory rate
  (e) Monitor vital signs
  (f) Monitor skin response

Treatment for Neurogenic Shock

NOTE: Diagnosis of Neurogenic shock is one of exclusion

(1) Securing the airway is the first priority
(2) Administer oxygen, if available
(3) Obtain baseline vital signs and level of consciousness
(4) Position casualty
  (a) On back with legs elevated 6 to 12 inches

(b) Place casualty so that head is lower than the feet if possible (except in head injury)
(c) If vomiting or bleeding around mouth, place on side or back with head turned to side (except in head injury)
(d) If you suspect head or neck injuries, or are unsure of casualty's condition, keep them lying flat.

(5) Keep patient at normal temperature. Attempt to maintain normal body temperature, to prevent hypothermia and minimize effect of shock.

(6) Fluid therapy
(a) Intravenous fluid administration is the single most important factor in treatment of any type of shock except cardiogenic shock
(b) Two 16 gauge IV's ACF Bilateral
(c) Normal saline is adequate until properly cross-matched whole blood can be administered
(i) Replace lost blood volume
(ii) Replace lost extracellular fluid
(d) All shock is severe, immediate administration of fluids is warranted.

(7) Drug therapy
(a) High dose corticosteriods given intravenously over the first two – three days. Ordered by MD.

(8) Provide on-going assessment
(a) Monitor level of consciousness
(b) Monitor blood pressure
(c) Monitor heart rate
(d) Monitor respiratory rate
(e) Monitor vital signs
(f) Monitor skin response

Treatment for Anaphylactic shock

(1) Securing the airway is the first priority
(2) Exposure to the causative agent, if identified, must be terminated if ongoing
(3) First-line therapies, during acute stage of anaphylaxis
(a) Epinephrine
(b) IV fluids
(c) Oxygen (may be limited until reach BAS)
(4) Second-line therapies the soldier medic may use to prevent recurrences and treat anaphylaxis refractory to the first-line treatments
(a) Antihistamines
(b) Corticosteroids
(5) Evacuate

Perform a Casualty Assessment
Appendix A
Competency Skill Sheets

Primary Survey

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Ensure scene safety	P / F	P / F	P / F
b.	General appearance	P / F	P / F	P / F
c.	Airway Assessment (1) Rapidly assess for obstruction (2) Establish patent airway (Jaw Thrust Maneuver) (3) Provide C-spine immobilization (4) Clear airway of foreign bodies	P / F	P / F	P / F
d.	Breathing Assessment (1) Expose the neck and chest (2) Determine respiration rate (3) Auscultate chest bilaterally	P / F	P / F	P / F
e.	Circulation Assessment (1) Determine pulse rate (2) Identify hemorrhage	P / F	P / F	P / F
f.	Assess Neurological Status (1) Used AVPU (2) Assess pupils	P / F	P / F	P / F
g.	Expose Wounds (1) Removed equipment and clothes	P / F	P / F	P / F

Instructor Comments:

Primary and Secondary Survey

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Ensure scene safety	P / F	P / F	P / F
b.	General appearance	P / F	P / F	P / F
c.	Airway Assessment (1) Rapidly assess for obstruction (2) Establish patent airway (Jaw Thrust Maneuver) (3) Provide C-spine immobilization (4) Clear airway of foreign bodies	P / F	P / F	P / F
d.	Breathing Assessment (1) Expose the neck and chest (2) Determine respiration rate (3) Auscultate chest bilaterally	P / F	P / F	P / F
e.	Circulation Assessment (1) Determine pulse rate (2) Identify hemorrhage	P / F	P / F	P / F
f.	Assess Neurological Status (1) Used AVPU (2) Assess pupils	P / F	P / F	P / F
g.	Expose Wounds (1) Removed equipment and clothes	P / F	P / F	P / F
	--- SECONDARY SURVEY ---			
h.	Obtain AMPLE history	P / F	P / F	P / F
i.	Inspect and palpate head.	P / F	P / F	P / F
j.	Inspect and palpate eyes and ears	P / F	P / F	P / F
k.	Inspect and palpate nose and mouth	P / F	P / F	P / F
l.	Inspect neck	P / F	P / F	P / F
m.	Inspect back	P / F	P / F	P / F
n.	Inspect, palpate, auscultate, and percuss thorax and lung fields	P / F	P / F	P / F
o.	Auscultate heart	P / F	P / F	P / F
p.	Inspect, auscultate, and palpate abdomen	P / F	P / F	P / F
q.	Inspect and palpate pelvis	P / F	P / F	P / F
r.	Inspect extremities (DCAP BTLS)	P / F	P / F	P / F
s.	Assess CNS (1) Loss of bladder / bowel (2) Paralysis	P / F	P / F	P / F

Instructor Comments:

Airway Management and Oxygen Therapy
Appendix B
Competency Skill Sheets

Nasal Trumpet

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Assessed nasal passages for apparent obstruction.	P / F	P / F	P / F
b.	Selected appropriately sized airway.	P / F	P / F	P / F
c.	Lubricated the nasal pharyngeal airway with a water soluble lubricant or tap water.	P / F	P / F	P / F
d.	Inserted the tip of the airway into the nostril and directs it posteriorly and toward the ear.	P / F	P / F	P / F
e.	Gently passed the nasal pharyngeal airway through the nostril into the hypopharynx with a slight rotating motion, until the flange rests against the nostril.	P / F	P / F	P / F
f.	Ventilated the patient with a pocket face mask or bag-valve-mask.	P / F	P / F	P / F

Instructor Comments:

J Tube

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Selected the proper-sized airway.	P / F	P / F	P / F
b.	Opened the patient's mouth with the chin-lift maneuver.	P / F	P / F	P / F
c.	Inserted a tongue blade on top of the patient's tongue far enough back to depress the tongue, but not gag the patient.	P / F	P / F	P / F
d.	Inserted the airway, gently sliding the airway over the curvature of the tongue until the device's flange rests on tope of the patient's lips.	P / F	P / F	P / F
e.	Ensured proper fit and that the airway does not push the tongue backward, blocking the airway.	P / F	P / F	P / F
f.	Removed the tongue blade.	P / F	P / F	P / F
g.	Ventilated the patient with a pocket face mask or bag-valve-mask.	P / F	P / F	P / F

Instructor Comments:

Combitube

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Inspected upper airway for visual obstruction.	P / F	P / F	P / F
b.	Hyperventilated the patient for 30 seconds.	P / F	P / F	P / F
c.	Positioned patient head in a neutral position.	P / F	P / F	P / F
d.	Tested both cuffs (white and blue) for leaks by inflating with 15ml (white) or 85ml (blue) of air.	P / F	P / F	P / F
e.	Inserted the combitube in the same direction as natural curvature of pharynx. (1) Grasped the tongue and lower jaw between index fingers and lifts upward (jaw-lift maneuver) (2) Inserted the combitube gently but firmly until the black rings on the tube are positioned between the patient's teeth. (3) Did not use force - if tube does not insert easily, student withdrew tube and retried. Student hyperventilated between each attempt. (4) Inflated the pharyngeal cuff through line #1 (blue) with 100cc of air and the distal cuff through line #2 (white) with 15 ml of air. (5) Ventilated through the primary (blue) tape (6) Confirmed the tube placement by ausculatating breath sounds bilaterally and ausculatating over stomach. (7) Esophageal placement - combitube was placed in the esophagus when: 1) breath sounds are present bilaterally and 2) epigastric sounds are absent. (a) Student identified tube placement. (b) Continued to ventilate through primary (blue) tube.	P / F	P / F	P / F

	(c) Hyperventilated for 30 seconds.			
(8)	Tracheal placement - Combitube was placed in the trachea when breath sounds are absent and epigastric sounds are present. (a) Student identified tube placement (b) Ventilated through secondary (white) tube (c) Hyperventilated for 30 seconds			
(9)	Unknown placement - both breath and epigastric sounds are absent. (a) Student immediately deflates cuffs (blue then white) (b) Slightly withdraws tube then reinflates cuffs (blue then white) (c) Ventilates, then reassesses tube placement (d) If breath sounds are still absent, student immediately deflates cuffs and extubates. (e) Student inserts oropharngeal or nasopharyngeal airway and hyperventilates patient.			

Instructor Comments:

Needle Chest Decompression

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Assessed the patient to make sure that condition is due to a pneumothorax	P / F	P / F	P / F
b.	Administered high-flow oxygen and ventilatory assistance	P / F	P / F	P / F
c.	Determined if indications for emergency decompression are present	P / F	P / F	P / F
d.	Identified the second or third intercostal space on the anterior chest at the midclavicular line on the same side as the pneumothorax (1) Felt for "angle of Louis" - bump located on sternum about a quarter of the way from the suprasternal notch	P / F	P / F	P / F
e.	Quickly prepared the area with an antiseptic	P / F	P / F	P / F
f.	Made a one-way valve by inserting a 12- or 14-gauge over the needle catheter through a condom. (1) Used a catheter that is long enough to enter the pleural space (2) Ensured maximum catheter length should be 5 cm	P / F	P / F	P / F
g.	Removed plastic cap from a 2-inch large-bore catheter (1) Inserted the needle into the skin over the superior border of the third rib, midclavicular line, and direct it into the intercostal space at a 90-degree angle to the third rib (2) As the needle entered the pleural space, there was a "pop" and possibly a hiss of air (3) Removed the needle and leave the catheter in place (4) Stabilized catheter hub to chest with tape	P / F	P / F	P / F
h.	Left the plastic catheter in place until it is replaced by a chest tube at the hospital	P / F	P / F	P / F
i.	Intubated the patient if indication	P / F	P / F	P / F
j.	Monitor closely for reoccurrence of pneumothorax	P / F	P / F	P / F

Instructor Comments:

Control Bleeding
Appendix C
Competency Skill Sheets

Primary Survey

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Ensure scene safety	P / F	P / F	P / F
b.	General appearance	P / F	P / F	P / F
c.	Airway Assessment (1) Rapidly assess for obstruction (2) Establish patent airway (Jaw Thrust Maneuver) (3) Provide C-spine immobilization (4) Clear airway of foreign bodies	P / F	P / F	P / F
d.	Breathing Assessment (1) Expose the neck and chest (2) Determine respiration rate (3) Auscultate chest bilaterally	P / F	P / F	P / F
e.	Circulation Assessment (1) Determine pulse rate (2) Identify hemorrhage	P / F	P / F	P / F
f.	Assess Neurological Status (1) Used AVPU (2) Assess pupils	P / F	P / F	P / F
g.	Expose Wounds (1) Removed equipment and clothes	P / F	P / F	P / F

Instructor Comments:

Mechanical Methods

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Ensures scene safety.	P / F	P / F	P / F
b.	Assesses general appearance.	P / F	P / F	P / F
c.	Manage the airway. (1) Rapidly assesses for obstruction (2) Establishes a patent airway, if needed (Jaw Thrust Maneuver) (3) Provides C-spine immobilization (4) Clear airway of foreign bodies, if needed.	P / F	P / F	P / F
d.	Assess and manage breathing. (1) Exposes the neck and chest assuring C-spine immobilization (2) Determines respiration rate and depth. (3) Inspects and palpates neck and chest for tracheal deviation, bilateral chest movement, use of accessory muscles and any signs of injury. (4) Percuss chest for presence of dullness or hyperresonance. (5) Auscultates chest bilaterally. (6) Adminsters high concentration oxygen, if available.	P / F	P / F	P / F
e.	Assess and manage circulation (1) Identifies source of hemorrhage in anterior thigh. (2) Applies direct pressure to external bleeding site and applies a dressing to control hemorrhage. (3) Elevates lower extremities. (4) Establishes two large-bore IVs of Normal Saline. (5) Determines pulse rate and capillary refill. (6) Assesses skin color and temperature.	P / F	P / F	P / F
f.	Assesses neurological status (1) Uses AVPU. (2) Assesses pupils (PERRLA)	P / F	P / F	P / F
g.	Exposes wounds. (1) Removes equipment and clothes.	P / F	P / F	P / F

Instructor Comments:

IV Infusion

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Obtained a physician's order.	P / F	P / F	P / F
b.	Performed a patient care handwash.	P / F	P / F	P / F
c.	Gathered equipment.	P / F	P / F	P / F
d.	Identified patient and explained procedure. Asked about allergies.	P / F	P / F	P / F
e.	Inspected and assembled equipment.	P / F	P / F	P / F
f.	Hung container at least 2 feet above the level of the patient's heart and squeezed the drip chamber until it is half full of solution.	P / F	P / F	P / F
g.	Removed air from the tubing.	P / F	P / F	P / F
h.	Cut several tape strips and hung them in accessible location.	P / F	P / F	P / F
i.	Selected infusion site.	P / F	P / F	P / F
j.	Prepared the infusion site. (1) Applied constricting band 2" above venipuncture site - tight enough to stop venous flow, but not so tight that radial pulse cannot be felt. (2) Instructed patient to open and close first several times to increase circulation. (3) Selected and palpates a prominent vein. (4) Cleaned skin with antiseptic sponge in a circular motion from the center outward.	P / F	P / F	P / F
k.	Put on gloves.	P / F	P / F	P / F
l.	Held catheter with dominant hand and removed protective cover without contaminating needle.	P / F	P / F	P / F
m.	Held flash chamber with thumb and forefinger directly above the vein or slightly to the side of the vein.	P / F	P / F	P / F
n.	Drew skin below cleansed area downward to hold the skin taut over the site of the venipuncture.	P / F	P / F	P / F
o.	Positioned the needle point, bevel up, parallel the vein and about 1/2 inch below the venipuncture site.	P / F	P / F	P / F
p.	Held the needle at approximately 20-30 degree angle and pierced skin.	P / F	P / F	P / F
q.	Decreased angle until almost parallel to skin	P / F	P / F	P / F

	surface and direct it toward the vein. Continued advancing the needle/catheter until vein is pierced.			
r.	Checked for blood in the flash chamber.	P / F	P / F	P / F
s.	Advanced catheter/needle unit approximately 1/8 inch further to insure catheter placement in the vein.	P / F	P / F	P / F
t.	Stabilized flash chamber with dominant hand, grasped catheter hub with non-dominant hand and treaded catheter into vein to catheter hub.	P / F	P / F	P / F
u.	Removed flash chamber/needle and laid aside.	P / F	P / F	P / F
v.	With dominant hand, removed protective cover from needle adapter on tubing and quickly connected adapter into the catheter hub, while maintaining stabilization of the hub with non-dominant hand.	P / F	P / F	P / F
w.	Told patient to unclench fist and released constricting band.	P / F	P / F	P / F
x.	Unclamped IV tubing and adjusted flow rate to appropriate drip rate.	P / F	P / F	P / F
y.	Examined infusion site for infiltration and discontinued if infiltration is present.	P / F	P / F	P / F
z.	Cleaned the area of blood, if necessary, and secured hub of catheter with tape, leaving hub and tubing connection visible.	P / F	P / F	P / F
aa.	Applied a sterile dressing over the puncture site.	P / F	P / F	P / F
bb.	Looped the IV tubing in extremity and secured with tape.	P / F	P / F	P / F
cc.	Splinted the arm loosely on a padded splint, if necessary, to reduce movement.	P / F	P / F	P / F
dd.	Printed the date, gauge of the catheter, and time IV was started and initials of person starting IV on a piece of tape and secured the tape to the dressing.	P / F	P / F	P / F
ee.	Printed patient's identification, drip rate, date and time the IV infusion was initiated and the person initiating the IV on a piece of tape and secured the tape to the IV container.	P / F	P / F	P / F
ff.	Printed the date and time the tubing was put in place and the initials of the person initiating the IV on a piece of tape and wrapped the tape around the tubing, leaving a tab.	P / F	P / F	P / F
gg.	Re-examined the IV site for infiltration.	P / F	P / F	P / F
hh.	Removed gloves and performed a patient care handwash.	P / F	P / F	P / F
ii.	Recorded the procedure on the appropriate form.	P / F	P / F	P / F

91W10
Advanced Individual Training Course

Evacuation Handbook

Department of the Army
Academy of Health Sciences
Fort Sam Houston, Texas 78234

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TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked M5 Bag or Combat Medic Vest System. You encounter casualty(ies) that has/have been assessed and injury(ies) prioritized. A field medical card (FMC) has been initiated and attached to the casualties' uniform. Unable to maintain casualty(ies) in the area. Casualty(ies) requires/require evacuation to the next echelon of care.

Medical Evacuation System

The purpose of the Medical Evacuation System is to ensure that the sick and injured are moved quickly into and through the Combat Health Support system

The preponderance of soldiers who die in combat do so within minutes due to penetrating trauma and hemorrhage

In order to save lives prompt localization, resuscitation and stabilization, followed by timely/rapid evacuation of casualties is essential

Soldiers on the dispersed and non-linear battlefield are subject to increased evacuation legs

Medical evacuation encompasses

(1) Collecting the wounded
(2) Casualty assessment
(3) Casualty stabilization
(4) Sorting (Triage) and prioritizing
(5) Reporting location and casualty status
(6) Anticipating complications and being ready to perform emergency medical intervention

The benefits of an efficient medical evacuation system are

(1) Minimizes mortality by rapidly and efficiently moving the sick , injured, and wounded to a MTF
(2) Quickly clears the battlefield enabling the tactical commander to continue his mission
(3) Builds the morale of the soldiers by demonstrating that care is quickly available if they are wounded
(4) Provides en route medical care that is essential for improving the prognosis and reducing disability of wounded, injured, or ill soldiers

Additional benefits of an efficient medical evacuation system are

(1) Provide timely re supply of medical supplies through the backhaul method using returning ambulances
(2) Acts as a carrier of medical records and re supply requests
(3) Provides transportation of medical personnel and equipment

Medical evacuation is performed by dedicated medical vehicles and aircraft that are staffed with medical personnel who provide en-route medical care.

(1) Medical evacuation is conducted using vehicles specifically designed to provide en-route medical care

(2) The provision of en route care on medically equipped vehicles or aircraft enhances casualty survivability

Casualty Evacuation (CASEVAC) is a term used by non medical units to refer to the movement of casualties aboard non medical vehicles or aircraft.

(1) En-route care is limited to the equipment carried by the individual providing care
   (a) Combat Lifesavers
   (b) Buddy aid

(2) The decision to use this form of casualty transport is a decision made by the commander based on
   (a) Availability of organic medical platoon evacuation assets
   (b) The number of casualties
   (c) The tactical situation

(3) Medical regulating is the tool used to identify patient's awaiting evacuation to the next echelon of medical care, it:
   (a) Coordinates and controls the movement of patients through the echelons of care
   (b) Includes the functions of casualty reporting and accountability

Echelons of medical care

Combat health support is arranged in echelons of care. Each echelon reflects an increase in medical capabilities while retaining the capabilities found in the preceding echelon

Capabilities of each echelon consist of

(1) Echelon I. The first medical care that a soldier receives is provided at Echelon I. This echelon of care includes:
   (a) Immediate far forward care
   (b) Disease in non battle injury prevention(DNBI)
   (c) Combat stress control preventive measures
   (d) Patient collection
   (e) Medical evacuation from supported units to supporting Medical Treatment Facilities (MTFs)
   (f) Treatment provided by designated combat medics or treatment squads (Battalion Aid Stations [BASs]) in conventional forces

(2) Echelon II. At this echelon, care is provided at the clearing stations that are operated by the treatment platoons of the medical company. This echelon of care includes.
   (a) Emergency medical treatment including beginning resuscitation is continued

(b) Additional emergency measures are instituted but do not go beyond the measures dictated by immediate necessities
(c) O+ Whole blood is available here
(d) Limited X-ray, laboratory, and dental capabilities are present here

(3) Echelon III. At this echelon the casualty is treated in an MTF staffed and equipped to provide resuscitation, initial wound surgery, and post operative treatment.

(4) Echelon IV. At Echelon IV, the patient is treated in a hospital staffed and equipped for general and specialized medical and surgical care to stabilize the patient for further evacuation out of theatre.

(4) Echelon V. Echelon V care is provided by support base hospitals generally located outside the theatre of operations.

It is the medical evacuation system that moves casualties/patients into and through each echelon of medical care provided

TERMINAL LEARNING OBJECTIVE

You encounter casualty(ies) that has/have been assessed and injury(ies) prioritized. A field medical card (FMC) has been initiated and attached to the casualties' uniform. The rights and duties set forth in the Conventions are part of the supreme law of the land. The United States is obligated to adhere to these obligations even when an opponent does not. It is a DOD and Army policy to conduct operations in a manner consistent with these obligations.

Identify Distinctive Markings and Camouflage of Medical Facilities and Evacuation Platforms

All US medical facilities and units, except veterinary, display the distinctive flag of the Geneva Conventions. The flag consists of a red cross on a white background. It is displayed over the unit or facility and in other places as necessary to adequately identify the unit or facility as a medical facility

The Geneva Conventions authorizes the use of the following distinctive emblems on a white background:

(1) Red Cross
(2) Red Crescent
(3) Red Lion
(4) Sun

In operations conducted in countries using an emblem other than the Red Cross on a white background, US soldiers must be made aware of the different official emblems

United States forces are legally entitled to only display the Red Cross

(1) However, commanders have authorized the display of both the Red Cross and the Red Crescent to accommodate Host Nation concerns and to ensure that confusion of emblems would not occur
(2) Such use of the Red Crescent must be in a smaller size than the Red Cross

Camouflage of medical facilities (medical units, medical vehicles, and medical aircraft on the ground) are authorized when the lack of camouflage might compromise tactical operations

(1) The marking of facilities may be ordered by a NATO commander of at least brigade level or equivalent
(2) Such an order is to be temporary and local in nature and is rescinded as soon as circumstances permit
(3) It is not envisioned that fixed, large medical facilities will be camouflaged

Identify Medical Aircraft

Medical aircraft used exclusively for the removal of the sick and wounded and for the transport of medical personnel and equipment shall not be attacked, but shall be respected by belligerents, while flying at heights, times, and on routes specifically agreed upon between belligerents concerned

Medical aircraft shall bear, clearly marked, the distinctive emblem together with their national colors on their lower, upper, and lateral surfaces

Unless agreed otherwise, flights over enemy or enemy-occupied territory are prohibited

Medical aircraft shall obey every summons to land. In the event that a landing is thus imposed, the aircraft with it's occupants may continue it's flight after examination, if any

In the event of involuntary landing in enemy or enemy-occupied territory, the wounded and sick, as well as the crew of the aircraft, shall be prisoners of war; medical personnel will be treated as designated in the Geneva Conventions

Understanding Self-Defense and Defense of Patients

When engaging in medical evacuation operations, medical personnel are entitled to defend themselves and their patients. They are only permitted to use small arms.

The mounting of offensive weapons on dedicated medical evacuation vehicles and aircraft jeopardizes the protections afforded by the Geneva Conventions.

These offensive weapons can include, but are not limited to:

(1) Machine guns
(2) Grenade launchers
(3) Hand grenades
(4) Light antitank weapons

Medical personnel are only permitted to fire in their personal defense and for the protection of the wounded and sick in their charge against marauders and other persons violating the law of war

Treating and Guarding Enemy Prisoners of War

Care and treatment of Enemy Prisoners of War

(1) The standard of care for EPW's is the same as for U.S. forces IAW the Geneva Convention
(2) The standard of evacuation for EPW's is the same as for U.S. forces IAW the Geneva Convention

(3) Sick, injured, or wounded EPWs are treated and evacuated through normal medical channels, but are physically segregated from US, allied, or coalition patients
(4) Practice the five S's when dealing with wounded EPW's
  (a) Search, for weapons and documents. Report findings
  (b) Segregate into groups of Enlisted, noncommissioned Officers, and Officers
  (c) Silence, keep em quiet
  (d) Safeguard, protect them
  (e) Speed to the rear, The EPW patient is evacuated from the Combat Zone as soon as his medical condition permits
  (f) Inform Higher headquarters of the situation

Personnel resources to guard EPW patients are provided by the echelon commander. Medical personnel do not guard EPW patients

Compliance with the Geneva Conventions

The US is a party to and signatory of the Geneva Conventions. These Conventions afford protection for medical personnel, facilities, and evacuation platforms (to include aircraft on the ground)

Violation of these Conventions can result in the loss of protection afforded by them

Medical personnel (Medical Platoon Leader's, Platoon Sergeant's, Senior Line Medic's) should inform the tactical commander of the consequences of violating the provisions of these conventions.

The consequences can include the following:
(1) Medical evacuation assets subjected to attack and destruction by the enemy
(2) Combat health support capability degraded
(3) Captured medical personnel becoming prisoners of war rather than retained persons. They may not be permitted to treat fellow prisoners
(4) Loss of protected status for medical unit, personnel, or evacuation platforms (to include aircraft on the ground)

Even the perception of impropriety can be detrimental to the mission and US interests. Combat Health Support commanders must ensure that they do not give the impression of impropriety in the conduct of medical evacuation operations

TERMINAL LEARNING OBJECTIVE

Given a casualty requiring medical evacuation, and a patient pickup site, request medical evacuation. Necessary equipment and materials: secure operational communications equipment, request format, a standard scale military map, a grid coordinate scale, and training SOI.

Determination to Request Medical Evacuation and Assignment of Medical Evacuation Precedence

The determination to request medical evacuation and assignment of a precedence is made by the senior military person present.

This decision is based on the advice of the senior medical person at the scene, the patient's condition and the tactical situation.

Assignment of a medical evacuation precedence is necessary.

The precedence assigned to the casualty(ies) provides the supporting medical unit and controlling headquarters with:

(1) Information that is used in determining priorities for committing their evacuation assets
(2) Validated information in controlling the flow so that resources will not be strained

Overclassification (The tendency to classify a wound as more severe than it actually is) remains a continuing problem

(1) When properly classified, patients will be picked up as soon as possible
(2) Pick up is consistent with available resources and pending missions
(3) Those casualties in greatest need are evacuated first and receive the necessary care required to help ensure their survival

Precedence and the criteria used in resource assignment:

(1) Priority I – Urgent
    (a) Assigned to emergency cases that should be evacuated as soon as possible
    (b) Casualty requires evacuation within a maximum of 2 hours
    (c) Evacuation required in order to save life, limb, or eyesight
    (d) Used to prevent complications of serious illness, or to avoid permanent disability
(2) Priority IA – Urgent-Surgical
    (a) Assigned to patients who must receive far forward surgical intervention
    (b) Goal is to save life and to stabilize casualty for further evacuation
(3) Priority II – Priority
    (a) Assigned to sick and wounded personnel requiring prompt medical care
    (b) Used when the individual should be evacuated within 4 hours

(c) Medical condition could deteriorate to such a degree that he/she will become an URGENT precedence
(d) Requirements for special treatment are not available locally
(e) Casualty will suffer unnecessary pain or disability

(4) Priority III – Routine
(a) Assigned to sick and wounded personnel requiring evacuation but whose condition is not expected to deteriorate significantly
(b) Sick and wounded in this category should be evacuated within 24 hours

(5) Priority IV – Convenience: assigned to patients for whom evacuation by medical vehicle is a matter of medical convenience rather than necessity

Unit Responsibilities in Evacuation

Unit requesting evacuation prepares for and assist's during evacuation by:

(1) Ensuring that the tactical situation permits safe and successful evacuation
(2) Having an English-speaking representative at the pickup site when evacuation is requested for non-US personnel
(3) Ensuring that the casualty(ies) are ready for pickup when the request is submitted and provide casualty information, as required
(4) Receiving backhauled medical supplies and report the type, quantity, and where they are delivered
(5) Moving patients to the safest aircraft approach and departure point or AXP if they are to be evacuated by air
(6) Ground personnel should be familiar with principles of helicopter operations

Units must:

(1) Select and prepare the landing site. It is imperative that the type and number of aircraft are known so that the landing site can be adequately cleared and marked
(a) Criteria for Landing Sites:
(i) The Landing Zone (LZ) must be free of obstructions with sufficient space for the helicopter to be able to hover and maneuver during landing and takeoff into the prevailing wind whenever possible
(ii) Definite measurements for LZs cannot be prescribed since they vary with:
* Temperature
* Altitude
* Wind
* Terrain
* Loading conditions
* Individual helicopter characteristics
(iii) 30 Meters in diameter is the minimum requirement
(iv) Marking the LZ

* Any object likely to be blown about by wind from the rotor wash should be removed
* Obstacles which cannot be removed must be clearly marked so as to be readily seen by the pilot

(v) Identifying the landing site
* When the tactical situation permits the LZ should be marked with the letter H or an inverted Y
* Panels used to mark the LZ should be securely anchored to the ground to prevent them from being blown about
* The wind should be indicated (tactical situation permitting) with a wind sock or rag tied to a stick in the vicinity of the LZ
* Smoke grenades that emit colored smoke as soon as the aircraft is sighted can be used. The color of the smoke is verified by the aircrew and confirmed by the ground personnel

(2) Personnel loading the injured will take all of their commands regarding approach, loading and unloading of the aircraft from the pilot and crew chief

(3) Brief the pilot on the position of enemy troops and directs him to other units in the area, if asked

(4) A qualified soldier guides the helicopter in the landing site using hand signals during landing and takeoff when the tactical situation permits

(5) Mark friendly positions when armed helicopter escort is provided to prevent fratricide

CAUTION: Failure to follow proper safety procedures can result in injury or death.

Collect Medical Evacuation Information

Location of pickup site (Line 1)

(1) It is not necessary to encrypt grid coordinates when using secure communications equipment or channel skipping equipment

(2) To preclude misunderstanding, state that grid zone letters are included in the message.

(3) Obtain grid coordinates of the pickup site from the grid map of the operational area

NOTE: This information is required so that the evacuation vehicle crew knows where to pick up the casualty and the unit personnel coordinating the evacuation mission can plan the route for the evacuation vehicle (if casualties must be picked up from more than one location)

Radio frequency, call sign, and suffix (Line 2)

(1) Send the frequency of the radio at the pickup site, not a relay frequency
(2) The call signs (and suffix if used) on the person to be contacted at the pickup site may be transmitted in the clear
(3) Obtain radio frequency, call sign, and suffix of signal operation instructions from Si9gnal Operating Instruction (SOI), or the Automated Net Control Device (ANCD) or radio supervisor

NOTE: This information is required so that the evacuation vehicle crew can contact the requesting unit while en-route to obtain additional information(for example, a change in situation, directions, or other information)

Number of Patients by Precedence (Line 3) Report only applicable information and use the appropriate amount(s) and brevity code(s) as follows:

NOTE: The brevity code precedes the description (A- Urgent) in the line number block under the information column of the Procedure for Information Collection and MEDEVAC Request Preparation.

(1) **A – URGENT Complete** (evacuate as soon as possible or within 2 hours)
(2) **B - URGENT SURGICAL** (evacuate within 2 hours to the nearest surgical unit)
(3) **C - PRIORITY** (evacuate promptly or within 4 hours)
(4) **D - ROUTINE** (evacuate within 24 hours)
(5) **E - CONVENIENCE** (medical convenience rather than necessity)

NOTE: If two or more categories must be reported in the same request, insert the proword "Break" (e.g., I now separate the text from other parts of the message) between each category. These details are obtained as part of the evaluation(s) of the patient(s), and provided by the medic or the senior person present. This information is required by the unit controlling the evacuation vehicles in order to assist in prioritizing missions when more than one is received.

Special Equipment Required (Line 4). Some of the types of equipment and their brevity codes are as follows:

(1) **A** - None
(2) **B** - Hoist
(3) **C** - Extraction equipment
(4) **D** - Ventilator

NOTE: Information on special equipment requirements are determined as part of the evaluation(s) of the patient(s), from the medic or the senior person present. This information is required so that the equipment can be placed on board the evacuation vehicle prior to the start of the mission.

Number of Patients by Type (Line 5) Report only applicable information. If requesting MEDEVAC for both types, insert the word "Break" between the litter entry and ambulatory entry.

(1) **L** - (Litter) plus the number of patients
(2) **A** - (Ambulatory [sitting]) plus the number of patients

NOTE: Obtain information on patients by type, a part of the evaluation(s) of the patient(s), and the number of patients from the medic or the senior person present. This information is required to determine the appropriate number of evacuation vehicles to be dispatched to the pickup site. The information is also needed to configure the vehicles to carry the patients requiring evacuation.

Security of Pickup Site (Wartime) (Line 6) This information is used during wartime. Use one of the following brevity codes to transmit the information concerning pickup-site security.

(1) **N** - No enemy troops in the area
(2) **P** - Possibly enemy troops in the area (approach with caution)
(3) **E** - Enemy troops in the area (approach with caution)
(4) **X** - Enemy troops in the area (armed escort required)

NOTE: This information is required to assist the evacuation crew in assessing the situation and determining if assistance is required in accomplishing the mission. More definitive guidance can be furnished to the evacuation vehicle while it is en- route (for example, the specific location of the enemy would assist the crew in planning the approach).

Method of Marking Pickup Site (Line 7), use the following appropriate brevity code(s) for the method of marking the pickup site.

(1) **A** - Panels
(2) **B** - Pyrotechnic signal
(3) **C** - Smoke signal
(4) **D** - None
(5) **E** - Other

NOTE: This information based on the situation and the availability of materials and is provided by the medic or senior person present. The information is required to assist the evacuation aircraft crew in identifying the specific location of the pickup site. The color of the panels, smoke, or other markings should not be transmitted until the evacuation vehicle contacts the unit just prior to arrival. For security reasons, the crew should identify the color of the marking(s) and the unit should verify the color.

Patient Nationality and Status (Line 8). The codes and categories are as follows:

(1) **A** - U.S. military
(2) **B** - U.S. civilian
(3) **C** - Non-U.S. military
(4) **D** - Non-U.S. civilian
(5) **E** - Enemy Prisoner of War (EPW)

NOTE: The number of patients in each category need not be transmitted. Obtain this information as part of the patient evaluation(s), from the medic or senior person present. This information is required in planning for destination of facilities and the need for guards. The unit requesting evacuation support should ensure that there is an English-speaking representative at the pickup site.

NBC Contamination (Wartime) (Line 9). Use the appropriate brevity code(s) to indicate contamination:

(1) **N** - Nuclear
(2) **B** - Biological
(3) **C** - Chemical

NOTE: Obtain NBC contamination situation information from the medic or senior person present. Include this line only when applicable. This information is required to assist in planning for the mission. Determine which evacuation vehicle will accomplish the mission and when it will be accomplished (arrive at the pickup site). Information concerning the vehicle to be used and the time of arrival can be obtained from the evacuation unit.

Prepare a Medical Evacuation Request

During wartime, brevity codes must be used in preparing all medical evacuation requests

NOTE: Under all wartime conditions, these requests are transmitted by secure means only. Therefore, the use of nonsecure communications dictates that the request be transmitted in encrypted form.

(1) Use brevity codes listed in FM 8-10-6, Evacuation Request Procedures
(2) Brevity codes should also be in SOI (ANCD)
(3) Locally brevity devised codes are not authorized
(4) The unit preparing the request does not have access to secure communications the medical evacuation request must be encrypted
(5) Information on the form must be encrypted except:
    (a) Medical evacuation line number identifier. This information is always transmitted in clear text.
    (b) Call sign and suffix (Line 2) which can be transmitted in clear text

During peacetime, two line number items (Lines 6 and 9) will change. More detailed procedures for use of the peacetime request format must be developed by each local command to meet specific requirements

General rules of radio communications:

(1) Transmission Security: The following basic rules are essential to transmission security and will be strictly enforced on all military radiotelephone circuits

(2) No transmission will be made if it is not authorized by the proper authority
(3) The following practices are specifically forbidden:
  (a) Violation of radio silence
  (b) Unofficial conversation between operators
  (c) Transmission on a directed net without permission
  (d) Excessive tuning and testing
  (e) Transmission of the operator's personal sign or name
  (f) Unauthorized use of plain language
  (g) Use of other than authorized PROWORDs
  (h) Unauthorized use of plain language in place of applicable PROWORDs or operating signals
  (i) Association of classified call signs and address groups with unclassified call signs
  (j) Profane, indecent, or obscene language

Call Signs are used in radio communications to identify a communications facility, a command, an authority, or a unit. There are two forms of call signs: complete call signs and abbreviated call signs

Complete call signs consist of a letter - number - letter combination and a suffix and are used when:
(1) Entering a net in which you do not normally operate
(2) When so requested by the NCS or another station in the net
(3) Abbreviated call signs are used at all other times
  (a) EXAMPLES:
    Complete Call Sign_____A2D28
    Abbreviated Call Sign_____D28
  (b) If no confusion exists as to which operators are on the radio net, no call signs need be used

Pronunciation of Letters and Numerals
(1) To avoid confusion and errors during voice transmission, special techniques have been developed for pronouncing letters and numerals
(2) These special techniques resulted in the phonetic alphabet and phonetic numerals. The phonetic alphabet is used by the operator to spell difficult words and thereby prevent misunderstanding on the part of the receiving operator.
(3) The phonetic alphabet is also used for the transmission of encrypted messages. For example, the cipher group CMVVX is spoken "CHARLIE MIKE VICTOR VICTOR XRAY."
(4) Numbers are spoken digit by digit, except that exact multiples of thousands may be spoken as such. For example, 84 is "AIT FOW ER," 2,500 is "TOO FIFE ZE RO ZE RO," and 16,000 is "WUN SIX TOUSAND."
(5) The date-time group is always spoken digit by digit, followed by the time zone indication. For example, 291205Z is "TOO NIN-ER WUN TOO ZE-RO FIFE ZOO-LOO."

(6) Map coordinates and call sign suffixes also are spoken digit by digit. To keep voice transmission as short and clear as possible, radio operators use procedure words (PROWORDs) to take the place of long sentences.

Identify Types of Medical Evacuation Request Formats and Procedures

The medical evacuation request is used for requesting evacuation support from

(1) Air ambulances
(2) Ground ambulances

Two established medical evacuation request formats (ref. 9 line MEDEVAC request)

(1) Wartime
(2) Peacetime

Differences between wartime and peacetime medical evacuation request formats and procedures

(1) Line 6 of request
  (a) Change from number and type of wound, injury, or illness (two gunshot wounds and one compound fracture) in peacetime to Security of pickup site in wartime
  (b) If serious bleeding is reported, the patient's blood type should be given, if known
(2) Line 9 of request
  (a) Change from description of terrain (flat, open, sloping, wooded) in peacetime to NBC contamination in wartime
  (b) If possible, include relationship of landing area to prominent terrain features

Differences in security between wartime and peacetime in requesting procedures

(1) Under all nonwar conditions, the safety of US military and civilian personnel outweighs the need for security: Clear text (Information not encrypted for transmission) transmissions of medical evacuation requests are authorized
(2) During wartime, the rapid evacuation of patients must be weighed against the importance of unit survivability: Wartime medical evacuation requests are transmitted by secure means only

Transmit the Request

The medical evacuation request should be made by the most direct communications means to the medical unit that controls evacuation assets.

The communications means and channels used depend on the situation (organization, communication means available, location on the battlefield, and distance between units).

The primary and alternate channels to be used are specified in the unit

evacuation plan.

Security transmissions

(1) Under all wartime conditions, these requests are transmitted by SECURE MEANS only
(2) Nonsecure communications dictates that the request be transmitted in ENCRYPTED FORM
(3) Regardless of the type (secure or nonsecure) of communications equipment used in transmission must:
    (a) Make proper contact with the intended receiver
    (b) Use the effective call sign and frequency assignments from the SOI
    (c) Use the proper radio procedure
    (d) Ensure that transmission time is kept to a minimum (25 Seconds maximum)
    (e) Provide the opening statement: "I HAVE A MEDEVAC REQUEST"

Receiver Acknowledgement - after the appropriate opening statement is made, the transmitting operator

(1) Breaks for acknowledgment
(2) Authentication by the receiving or transmitting unit should be done in accordance with the TSOP

Clear Text and Encrypted Transmissions

(1) If secure communications equipment is used in transmission
    (a) Request will be transmitted in CLEAR TEXT
    (b) However, if the communications equipment used in transmission is not secure, the request must be transmitted in encrypted form with the exception of the following:
        (i) Medical evacuation line number identifier (Line 1, Line 2)
        (ii) Call sign and suffix in Line 2 may be transmitted in the clear

Letter and Numeral Pronunciation

(1) Letters and numbers pronounced according to standard radio procedure
(2) Give Line Number Identifier followed by applicable information

Medical Evacuation Request Line Numbers 1 through 5

(1) Line numbers 1 –5 must be transmitted first
(2) Allows evacuation unit to begin mission without delay
(3) Lines 6 – 9 should be transmitted as soon as possible

Monitoring requirements

(1) After transmission and authentication monitor frequency
(2) Wait for additional information
(3) Relay contact information from evacuation vehicles

Relay Requests

NOTE: If the unit receiving the request does not control the evacuation means, it must relay the request to the headquarters on unit that has control, or to another relaying unit. When relaying to a unit without secure communications means:

Transmit in encrypted form

Regardless of method of transmission, must ensure relay is the exact information originally received

Transmit by secure means

Radio call sign and frequency relayed (Line 2 of the request) should be that of the requesting unit and not that of the relaying unit

If possible, intermediate headquarters or units relaying requests will monitor the frequency specified in Line 2

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked M5 Bag or Combat Medic Vest System. You encounter multiple casualties with a variety of symptoms and suspected injuries.

Identify the Principles Which Govern the Priorities for Treatment and Evacuation

Triage - a system used for categorizing and sorting patients according to the severity of their injuries. AFFORD THE GREATEST NUMBER OF CASUALTIES

THE GREATEST CHANCE OF SURVIVAL.

(1) Survey and classify casualties for the most efficient use of available medical personnel and supplies
(2) Assures treatment is directed first towards the patients who have the best chance to survive
(3) Locate troops with minor wounds, and return them to duty

CAUTION: Triage establishes the order of treatment, NOT whether treatment is given, regardless of the injury. Triage is usually the responsibility of the senior medical person.

Determine the tactical and environmental situation

(1) Necessity to transport casualties to a more secure collection point for treatment
(2) Number and location of the injured
(3) Severity of injuries
(4) Assistance available - buddy-aid, self-aid, medical personnel
(5) Evacuation support capabilities and requirements (i.e., air ambulance, ground transportation)

Chemical and nuclear weapons exposure

(1) Not to be used as criteria for sorting
(2) Field experience with these injuries does not exist

Perform triage - sorting multiple casualties into priorities for emergency care or evacuation to definitive care

Conventional battlefield casualties

(1) **Immediate** - patient whose condition demands immediate treatment to save life, limb, or eyesight. This category has the highest priority
  (a) Airway obstruction
  (b) Respiratory and cardio respiratory distress from otherwise treatable injuries (for example, electrical shock, drowning, or chemical exposure)
    (i) Cardio respiratory distress may not be considered an immediate condition on the battlefield
    (ii) It would be classified as expectant - this evaluation is contingent upon the mission, the

battlefield situation, number of casualties, support, etc

(c) Massive external bleeding e.g., amputation
(d) Shock
(e) Burns of the face, neck, hands, feet, or perineum and genitalia
(f) After a casualty with a life/limb-threatening condition has been stabilized, no further treatment (nonlife/limb-threatening) will be given until other "immediate" casualties have been treated
(g) Salvage of life takes priority over salvage of limb

(2) **Delayed** - patients who have less risk of losing life or limb by treatment being delayed
(a) Open chest wound (without respiratory distress)
(b) Abdominal wounds (without shock)
(c) Eye injury (severe, without hope of saving eyesight)
(d) Other open wounds
(e) Fractures
(f) Second and third degree burns (not involving the face, hands, feet, genitalia, and perineum) covering 20 percent or more of total body surface area

(3) **Minimal** - "Walking wounded", can be self-aid or buddy-aid
(a) Minor lacerations
(b) Contusions
(c) Sprains and strains
(d) Minor combat stress problems
(e) Burns 1st or 2d degree under 20 percent of total body surface area and not involving critical areas such as hands, feet, face, genitalia, or perineum
(f) Patients in this category usually are NOT evacuated to a medical treatment facility

(4) **Expectant** - patient so critically injured that only complicated and prolonged treatment offers any hope of improving life expectancy. Category to be used only if resources are limited, if in doubt as to severity of injury, treat in categories above
(a) Massive head injury with signs of impending death
(b) Burns, mostly third degree, covering more than 85 percent of body surface area

Integrated battlefield casualties
(1) Immediate
(a) Presence of life-threatening conventional injuries
(b) No signs and symptoms of chemical agent poisoning
(2) Chemical immediate
(a) Presence of signs and symptoms of severe chemical agent poisoning
(b) No conventional injuries

(3) Delayed
  (a) Presence of mild signs and symptoms of chemical agent poisoning
  (b) Presence of conventional injuries that are not life-threatening
(4) Minimal
  (a) Presence of minor conventional injuries
  (b) No signs and symptoms of chemical agent poisoning
(5) Expectant
  (a) Presence of both severe signs and symptoms of chemical agent poisoning and life-threatening conventional injuries
  (b) No conventional injuries and not breathing due to chemical agent poisoning

Prioritize casualties for Medevac by categories

Urgent - evacuation required as soon as possible but not later than 2 hours to save life, limb, or eyesight

(1) Generally, casualties whose condition(s) cannot be controlled and have the greatest opportunity for survival are placed in the urgent category
(2) Cardio respiratory distress
(3) Shock not responding to IV therapy
(4) Prolonged unconsciousness
(5) Head injuries with signs of increasing ICP
(6) Burns covering 20% to 85% of total body surface area

Urgent surgical - evacuation is required for patients who must receive far forward surgical intervention to save life and stabilize for further evacuation

(1) Decreased circulation in the extremities
(2) Open chest and/or abdominal wounds with decreased blood pressure
(3) Penetrating wounds
(4) Uncontrollable bleeding or open fractures with severe bleeding
(5) Severe facial injuries

Priority - evacuation is required within 4 hours or patient's condition could get worse and become an "urgent" or "urgent surgical" category condition

(1) Closed-chest injuries, such as rib fractures without a flail segment or other injuries that interfere with respirations
(2) Brief periods of unconsciousness
(3) Soft tissue injuries and open or closed fractures
(4) Abdominal injuries with no decreased blood pressure
(5) Eye injuries that do not threaten eyesight
(6) Spinal injuries
(7) Burns on the hands, face, feet, genitalia or perineum even if under 20% of the total body surface area

Routine - evacuation required within 24 hours for patients requiring additional care, but for whom evacuation is not immediately critical

(1) Burns covering 20% to 80% of the total body surface area if the casualty is receiving and responding o IV therapy
(2) Simple fractures
(3) Open wounds including chest injuries without respiratory distress
(4) Psychiatric cases
(5) Terminal cases

Convenience - evacuation of patients by medical vehicle is a matter of convenience rather than necessity

(1) Minor open wounds
(2) Sprains and strains
(3) Minor burns under 20% of total body surface area

Prepare a Medical Evacuation (MEDEVAC) Request

Line 1: Pickup location - provided by unit leader

Line 2: Radio frequency, call sign and suffix - provided by radio/telephone operator (RTO)

Line 3: Number of patients by precedence category

(1) Determine brevity codes
  (a) A - urgent
  (b) B - urgent surgical
  (c) C - priority
  (d) D - routine
  (e) E - convenience
(2) If using two or more categories, insert the word "break" between codes

Line 4: Special equipment required - (A) none, (B) hoist, (C) extraction equipment, (D) ventilator

Line 5: Number of patients by type - (L) litter + # of Pts, (A) ambulatory + # of Pts

Line 6: Security of pickup site or number/type of wounded, injured, illness

(1) Security of pickup site (wartime)
  (a) N - no enemy troops in area
  (b) P - poss ble enemy troops in area
  (c) E - enemy troops in area, approach with caution
  (d) X - enemy troops in area, armed escort required
(2) Number and type of wounded, injured, or illness (peace time). Give specific information regarding patient wounds by type (i.e., gunshot, auto accident, heart attack). Report serious bleeding along with patient blood type, if known

Line 7: Method of marking pickup site as provided by unit leader

Line 8: Patients' nationality and status - (A) U.S. military, (B) U.S. civilian, (C) Non-U.S. military, (D) Non-U.S. civilian, (E) EPW (enemy prisoners of war)

Line 9: NBC contamination or terrain description

(1) NBC contamination, if any (wartime) - (N) nuclear, (B) biological, (C) chemical

(2) Terrain description (peacetime) includes details of terrain features in and around proposed landing site. If possible, describe relationship of site to prominent terrain feature (i.e., lake, mountain, tower)

As a minimum, the first five items above must be provided in exact sequence listed

TERMINAL LEARING OJECTIVE

You encounter casualty(ies) that has/have been assessed and injury(ies) prioritized. A field medical card (FMC) has been initiated and attached to the casualties' uniform. Unable to maintain casualty(ies) in the area. Casualty(ies) requires/require evacuation to the next echelon of care.

Use, Components, and Requirements of the Field Medical Card (FMC)

Use - the field medical card (DD Form 1380) is used to document medical care given to casualties in a theater of operations

Components

(1) Field medical cards are issued as a pad
(2) Each pad contains an original card, a carbon protective sheet, and a duplicate
(3) Each pad has an attached wire to attach to patient

Requirements - the field medical card must be

(1) Reviewed and signed by the supervising AMEDD officer
(2) Prepared on any patient treated within a theater of operations
(3) Attached to the patient's clothing, where it will remain until their arrival at the hospital, their death and burial, or their return to duty
(4) Written legibly and concisely

Provide minimum information required on the FMC

NOTE: Each block of the FMC provides critical information to subsequent caregivers and must be properly filled in by the attending medic. Complete as a minimum, blocks 1,3,4,7,9, and 11. Complete blocks 2,5,6,8,12,13,14,15,16, and 17 as time permits.

BLOCK 1

(1) Full name
(2) Rank/grade
(3) Social security number (SSN)
(4) Military occupational specialty (MOS) or area of concentration for specialty code
(5) Religion and sex

BLOCK 3

(1) Use the figures in the block to show the location of the injury or injuries
(2) Check the appropriate box (es) to descr be the casualty's injury or injuries

BLOCK 4 - check the appropriate box for level of consciousness

BLOCK 7

(1) Check the yes or no box
(2) Write the dose administered
(3) Write the date and time it was administered

BLOCK 9

(1) Write treatment given
(2) Use block 14 for additional space

BLOCK 11 - your initials on the far right of the block

Complete the other blocks as time permits. Most blocks are self-explanatory. The following specifics are noted:

(1) Block 2 - enter the casualty's unit and country of whose armed forces he/she is a member. Check the armed services of the casualty
(2) Block 5 - write the casualty's pulse rate and the time that the pulse was measured
(3) Block 6 - check the yes or no box. If a tourniquet is applied write the time and date it was applied.
(4) Block 8 - write in the time, date, and type of IV solution given
(5) Block 10 - check the appropriate box. Write the date and time of disposition
(6) Block 12 - write the time and date of the casualty's arrival. Record the blood pressure, pulse, and respirations in the space provided.
(7) Block 13 - document the appropriate comments by the date and time of observation
(8) Block 14 - document the provider's orders by date and time. Record the dose of tetanus administered and the time it was administered. Record the type and dose of antibiotic administered and the time it was administered
(9) Block 15 - the signature of the provider or medical officer and date is written in this block
(10) Block 16 - check the appropriate box and enter the date and time
(11) Block 17 - this block will be completed by the United Ministry Team. Check the appropriate box of the service provided. The signature of the chaplain providing the service is written in this block.

Review Authorized Abbreviations

NOTE: In block 3 use only authorized abbreviation, however abbreviations may not be used for diagnostic terminology. Abraded wound - Abr. W

Contused wound - Cont. W
Fracture (compound) open - FC
Fracture (compound) open comminuted – FCC
Fracture simple (closed) - FS
Lacerated wound - LW
Multiple wounds - MW
Penetrating wound - Pen W
Perforating wound - Perf W
Severe - SV
Slight - SL
Gun Shot Wound - GSW

Steps in Initiating the Field Medical Card

Remove DD Forms 1380 from medical aid bag

Remove protective sheet from the carbon copy

Complete the minimum required blocks

Keep filled out white sheet (without wire)

Attach top form to casualty's uniform by twisting wire after threading it through the top buttonhole of uniform.

Keep field medical card in plain view.

TERMINAL LEARNING OBJECTIVE

Given a CMVS, immobilization splints and equipment and documentation forms. You encounter a casualty who requires medical treatment. Casualty must be extricated and removed from the immediate area. Initial assessment of casualty is not completed.

Overview of Manual Evacuation

Manual evacuation is the process of transporting casualties by manual carries
It is accomplished without the aid of a litter or other forms of transport
It is intended to end at the point where a more sophisticated means of evacuation becomes available. For example, manual evacuation ends when a litter, vehicle, or other form of conveyance is available

Steps in Casualty Handling

Casualty Handling:

(1) Casualties evacuated by manual means must be carefully handled.
(2) Rough or improper handling may cause further injury to the casualty.
(3) The evacuation effort should be organized and performed methodically.
(4) Each movement made in lifting or moving casualties should be performed as deliberately and as gently as possible.
(5) Casualties should not be moved before the type and extent of their injuries are evaluated and the required first aid (self-aid, buddy aid, or combat lifesaver) or Emergency Medical Treatment (combat medic or ambulance crew) is administered.

NOTE: The exception to this occurs when the situation dictates immediate movement for safety reasons. For example, if a casualty is on the ground near a burning vehicle, it may be necessary to move him a safe distance away from the vehicle. This situation dictates that the urgency of casualty movement outweighs the need to administer first aid or EMT. Even when immediate movement of casualties is required, they should be moved only far enough to be out of danger.

Steps taken prior to moving the casualty:

(1) Many lifesaving and life-preserving measures are carried out before evacuating injured or wounded soldiers
(2) Except in extreme emergencies, the type and extent of injuries must be evaluated before any movement of the casualty is attempted
(3) Measures are taken, as needed, to:
    (a) Open the airway and restore breathing and heartbeat
    (b) Stop bleeding prevent or control shock
    (c) Protect the wound from further contamination
(4) When a fracture is evident or suspected, the injured part must be immobilized
    (a) Every precaution must be taken to prevent broken ends of bone from cutting through muscle, blood vessels, nerves, and skin

(b) When a casualty has a serious wound, the dressing over the wound should be reinforced to provide additional protection during manual evacuation

General Rules for Bearers

General Rules for Bearers:

(1) In manual evacuation, individuals performing the evacuation are referred to as bearers
(2) Improper handling of a casualty can result in injury to the bearers as well as to the casualty
(3) To minimize disabling injuries (muscle strain, sprains, or other injuries) that could hamper the evacuation effort

The following rules should be followed:

(1) Use the body's natural system of levers when lifting and moving a casualty. Know your physical capabilities and limitations
(2) Maintain solid footing when lifting and transporting a casualty
(3) Use the leg muscles (not the back muscles) when lifting or lowering a casualty
(4) Use the shoulder and leg muscles (not the back muscles) when carrying or standing with a casualty
(5) Keep the back straight; use arms and shoulders when pulling a casualty
(6) Work in unison with other bearers, using deliberate, gradual movements. Slide or roll, rather than lift, heavy objects that must be moved
(7) Rest frequently, or whenever possible, while transporting a casualty

NOTE: Normally, a casualty's individual weapon is not moved through the evacuation chain with him. Weapons are turned in at the first available MTF (BAS or division clearing station) to be returned to the parent unit through supply channels. Individual equipment, to include protective clothing and mask, remains with the casualty and is evacuated with him.

Manual Carries

Manual Carries

(1) Manual carriers are tiring for the bearers and involve the risk of increasing the severity of the casualty's injuries.
(2) In some instances, however, they are essential to save the casualty's life.
(3) When a litter is not available or when the terrain or the tactical situation makes other forms of casualty transportation impractical, a manual carry may be the only means to transport a casualty to where a combat medic can treat him.

The distance a casualty can be transported by a manual carry depends upon many factors, such as:

(1) Strength and endurance of the bearers

(2) Weight of the casualty
(3) Nature of the injuries
(4) Obstacles encountered during transport
(5) Terrain and weather

Position the Casualty

Casualty Positioning

(1) The first step in any manual carry is to position the casualty to be lifted.
(2) If conscious, the casualty should be told how s/he is to be positioned and transported.
(3) This helps to lessen the casualty's fear of movement and to gain cooperation.
(4) It may be necessary to roll the casualty onto their abdomen, or back, depending upon the position in which s/he is lying and the particular carry to be used.
    (a) To roll a casualty onto their abdomen
        (i) Kneel at the casualty's uninjured side
        (ii) Place his arms above his head; cross his ankle that is farther from you over the one that is closer to you
        (iii) Place one of your hands on the shoulder that is farther from you; place your other hand in the area of his hip or thigh
        (iv) Roll the casualty gently toward you onto their abdomen
    (b) To roll a casualty onto their back, follow the same procedure described in (a) above, except gently roll the casualty onto his back, rather than onto their abdomen

Categories of Manual Carries

(1) One-Man Carries. These carries should be used when only one bearer is available to transport the casualty
    (a) The fireman's carry, is one of the easiest ways for one individual to carry another
    (b) Fireman's carry 2, The alternate method of the fireman's carry should be used only when the bearer believes it to be safer for the casualty because of the location of his wounds

(c) The arms carry, is useful in carrying a casualty for a short distance (up to 50 meters) and for placing a casualty on a litter

(d) Supporting carry, The casualty must be able to walk, or at least hop, on one leg, using the bearer as a crutch. This carry can be used to transport a casualty as far as he is able to wa k or hop

(e) Saddleback carry, Only a conscious casualty can be transported by the saddleback carry because he must be able to hold onto the bearer's neck

(f) Pack-strap carry, the casualty's weight rests high on your back. This makes it easier for you to carry the casualty a moderate distance (50 to 300 meters). To eliminate the possibility of injury to the casualty's arms, you must hold the casualty's arms in a palms-down position.

NOTE: Once the casualty is positioned on the bearer's back, the bearer remains as erect as possible to prevent straining or injuring his back.

(g) Pistol-belt carry, is the best one-man carry for a long distance (over 300 meters). The casualty is securely supported upon your shoulders by a belt. Both your hands and the casualty's (if conscious) are free for carrying a weapon or equipment, or for climbing obstacles. With your hands free and the casualty secured in place, you are also able to creep through shrubs and under low- hanging branches

NOTE: If pistol belts are not available for use, other items such as rifle slings, two cravat bandages, two litter straps, or any other suitable material which will not cut or bind the casualty may be used.

(h) The pistol-belt drag, as well as other drags, is generally used for short distances (up to 50 meters). This drag is useful in combat, since both the bearer and the casualty can remain closer to the ground than in other drags.

(i) The neck drag, is useful in combat because the bearer can transport the casualty as he creeps behind a low wall or shrubbery, under a vehicle, or through a culvert. If the casualty is unconscious, his head must be protected from the ground. The neck drag cannot be used if the casualty has a broken arm.

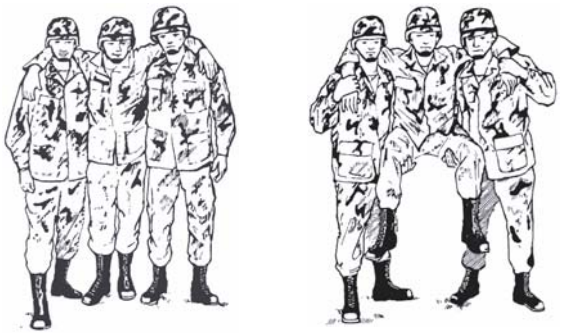
NOTE: If the casualty is conscious, he may clasp his hands together around your neck. If the casualty is unconscious, protect his head from the ground.

(j) The cradle-drop drag is effective in moving a casualty up or down steps.

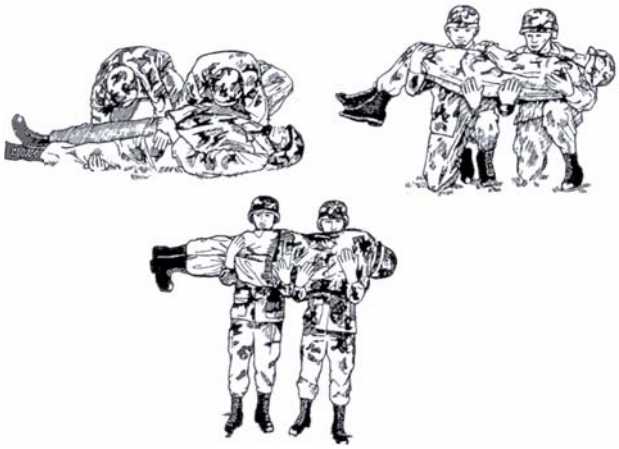
NOTE: If the casualty needs to be moved up the steps, you should back up the steps, using the same procedure. Cradle-drop drag. The load-bearing equipment (LBE) carry using the bearer's LBE can be used with a conscious casualty.

(2) Two-Man Carries. These carries should be used whenever possible. They provide more comfort for the casualty, are less l kely to aggravate injuries, and are less tiring for the bearers. Five different two-man carries can be used.

(a) The Two-man supporting carry can be used in transporting both conscious and unconscious casualties. If the casualty is taller than the bearers, it may be necessary for the bearers to lift the casualty's legs and let them rest on their forearms.



(b) The two-man arm's carry, is useful in carrying a casualty for a moderate distance (50 to 300 meters) and placing him on a litter. To lessen fatigue, the bearers should carry the casualty high and as close to their chests as possible.



(c) The two-man fore-and-aft carry, is a useful two-man carry for transporting the casualty over a long distance (over 300 meters).

(d) Four hand seat carry, only a conscious casualty can be transported with the four-hand seat carry since he must help support himself by placing his arms around the bearers' shoulders. This carry is especially useful in transporting a casualty with a head or foot injury for a moderate distance (50 to 300 meters).

(e) The two-hand seat carry is used when carrying a casualty for a short distance (up to 50 meters) and in placing a casualty on a litter.

Special Manual Evacuation Techniques

Special Manual Evacuation Techniques, The use of special techniques are required to remove injured soldiers from tanks, other armored vehicles, motor vehicles, or from other limited-access positions.

CAUTION: Parking next to a battle-damaged tank can draw antitank fire to the ambulance. If there is the potential for enemy fire, approach from the opposite side of the vehicle, using all available cover and concealment. Ambulance teams should park the vehicle behind protective terrain and dismount with the necessary equipment to provide emergency medical treatment to include stabilization of the head and spine, when required.

Observing the vehicle for fire

(1) Exercise extreme caution when approaching a burning vehicle
(2) Use fire suppression equipment and any protective measures available
(3) In some cases, attempting to save the crew of a burning vehicle may only result in the injury or death of the rescuer. This must be a rescuer's decision based on the specific circumstances.

The procedures for extracting a casualty include

(1) Gaining access to the casualty
(2) Administering lifesaving measures
(3) Freeing the casualty from the vehicle or other limited-access positions
(4) Preparing the casualty for removal
(5) Transporting the casualty from the site

Evacuating a casualty from a tank

(1) Steps in Casualty Evacuation
    (a) Observe the vehicle for fire
    (b) Stabilize head and neck if poss ble
    (c) Extract the casualty from the vehicle
    (d) Check and treat the casualty
    (e) Evacuate the casualty
(2) Vehicle Exit Procedures
    (a) The M1 is equipped with three exits. Some of these exits are used to evacuate specific crew members while others are used to evacuate any of the crew.
    (b) The exits are:
        (i) Commander's hatch
        (ii) Loader's hatch
        (iii) Driver's hatch
(3) Removing a wounded soldier from the interior of a tank is difficult and requires speed (as there is the potential that a damaged tank

may explode or the tank may be more easily acquired/targeted by the enemy)

(4) Whenever possible, crew members should be used to extract casualties from tanks because of their experience with these vehicles

(5) Removing casualties from a tank requires 3 crew members/soldiers

Steps taken by medical personnel prior to the casualty being extricated

NOTE: Rescuers should always attempt to stabilize the injured soldier's head and neck prior to moving him.

(1) If a head and or spine injury are suspected-
- (a) Medical personnel will stabilize the neck as much as possible prior to attempting to extract the casualty
- (b) The neck should be stabilized using a cervical collar, Kendricks Extrication Device (KED)
- (c) Manual stabilization (using forearms of the rescuer, as appropriate when no equipment is available)

(2) Depending upon the tactical situation, these procedures may be abbreviated if the vehicle and its crew are in imminent danger

NOTE: Rescuers should always attempt to stabilize the injured soldier's head and neck prior to moving him.

TERMINAL LEARNING OBJECTIVE

Given a CMVS, immobilization splints and equipment and documentation forms. You encounter a casualty who requires medical treatment. Casualty must be extricated and removed from the immediate area. Initial assessment of casualty is not completed.

Standard litters

(1) Standard collapsible litter is most widely used. It folds along the long axis only.

(a) Basic components of the litter

(i) Two straight, rigid, lightweight aluminum poles

(ii) A cover (bed) of cotton duck

(iii) Four wooden handles attached to the poles

(iv) Four stirrups (one bolted near the end of each pole) The stirrups support the litter when it is placed on the ground

(v) Two spreader bars (one near each end of the litter) These bars are extended crosswise at the stirrups to hold the cover taut when the litter is open

(vi) Two litter securing straps (one attached to each pole at the stirrup bolts) These straps are used to secure the litter when it is closed

(vii) Accessories such as patient securing straps

(b) Dimensions of the standard collaps ble litters are as follows:

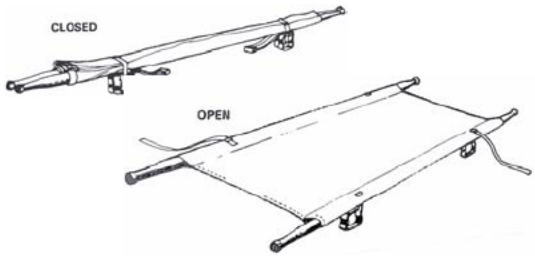
(i) Overall length is 90 inches

(ii) Overall width is 22 7/8 inches

(iii) Bed length is 72 inches

(iv) Bed width is 22 7/8 inches

(v) Weight is 15 pounds



(2) The patient securing strap is used to hold the patient in position on the litter
- (a) Designed to fit the straight and folding aluminum litters as well as other standard litters
- (b) Available in quantities of four per litter
- (c) Strap can also be used with an improvised litter as a patient restraint, if required
- (f) Made from 6-foot length of 2-inch webbing and a buckle with a locking device and spring

(3) Folding aluminum litter
- (a) Folding lightweight aluminum poles
- (b) Poles can be folded to one-half their length when litter is not in use

(4) Poleless semirigid litter
- (a) Useful in evacuating patients from ships and in mountainous areas
- (b) Holds the patient securely in position and facilitates the movement of patient in vertical position
- (c) Dimensions of litter are overall length, 83 3/4 inches; overall width, 22 3/4 inches; and it weighs 18 3/4 pounds. Basic components are:
  - (i) Semirigid cotton duck with wooden supports
  - (ii) Four webbing handles (two at each end). These straps can be used when the litter is carried by four bearers.
  - (iii) Four loops - used to insert the poles for carrying
  - (iv) Headpiece - used to support casualty's head
  - (v) Seven patient securing straps - used to secure patient to litter

(5) Poleless nonrigid litter
- (a) Folded and carried by combat medic
- (b) Has folds into which improvised poles can be inserted for evacuation over long distances
- (c) Slings for hoisting, lowering, and carrying, patient securing straps to secure the patient to the litter

(6) Stokes litter
- (a) Affords maximum security for the patient when litter is tilted
- (b) Dimensions and basic components and their functions:

(i) Composed of steel or aluminum tubular frame supporting a bed of wire mesh netting. Also has wooden slats to support patient's back.
(ii) Lower half is divided into two compartments to accommodate patient's legs
(iii) Four webbed patient securing straps for use in securing patient
(iv) Ropes, cables, or steel rings that can be attached to litter as required for vertical recoveries
(v) Dimensions are length, 84 inches; width, 23 inches; and weight, 31 1/2 pounds

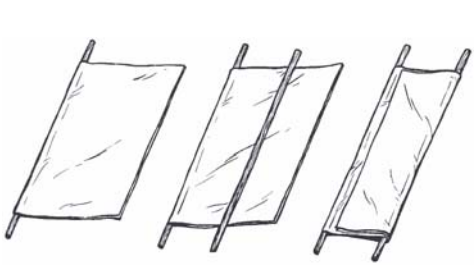
(7) SKED litter
(a) Compact and lightweight transport system used to evacuate a patient over land
(b) May also be used to rescue a patient in water

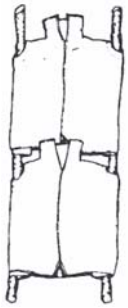
Improvised litters

NOTE: There are times when a patient may have to be moved and a standard litter is not available. The distance may be too great for manual carries or the patient may have an injury that would be aggravated by manual transportation. In these situations, litters can be improvised from materials at hand. Improvised litters must be as well constructed as possible to avoid the risk of dropping or further injuring the patient. Improvised litters are emergency measures and must be replaced by standard litters at the first opportunity.

(1) Many different types of litters can be improvised, depending upon materials available
(a) Satisfactory litter can be made by securing poles inside such items as:
(i) Blanket
(ii) Poncho
(iii) Shelter half
(iv) Tarpaulin-Material such as waterproof canvas
(v) Mattress cover
(vi) Jackets
(vii) Shirts
(viii) Bedticks, bags, and sacks
(b) Poles can be improvised from:
(i) Strong branches
(ii) Tent poles
(iii) Skis
(iv) Lengths of pipe
(c) Most flat-surface objects of suitable size can be used as litters
(i) Doors
(ii) Boards
(iii) Window shutters
(iv) Benches

(v) Ladders
(vi) Cots
(vii) Chairs





Chemical litters

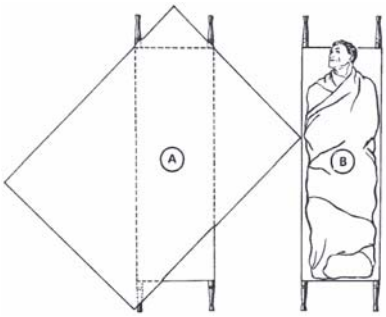
(1) Cover fabric is honeycomb weave of monofilament polypropylene
(2) Will not absorb agent and is not degraded by decontamination fluids
(3) Flame retardant and rip resistant
(4) Treated to withstand weather and sunlight
(5) Aluminum poles, painted with chemical agent resistant coating
(6) Conforms to all NATO standards and weights about 15 pounds

Dress a litter

NOTE: A litter is dressed with one, two, or three blankets to reduce danger of shock and to afford warmth and comfort during transport.

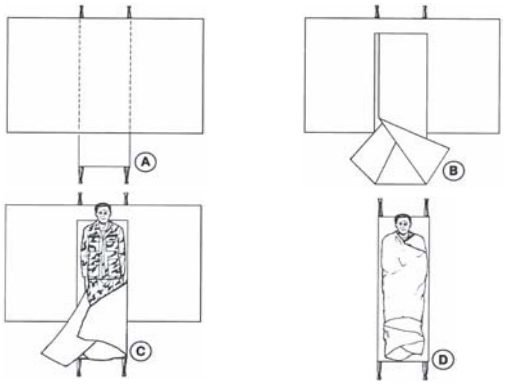
Dress with one blanket

(1) Place blanket diagonally over litter
(2) After casualty is placed on litter, bring sides of blanket over casualty and tuck edges at head and feet



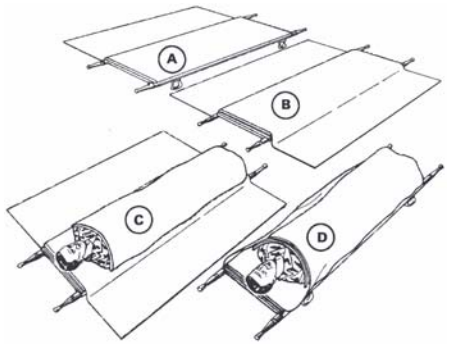
Dress with two blankets

(1) Place first blanket lengthwise across litter with blanket edge just beyond head end of litter
(2) Second blanket is folded in third, lengthwise, and placed over the first blanket - open folds about 2 feet from foot end
(3) After casualty is placed on litter, bring bottom of blanket up over casualty's feet. Leave a small fold between feet.
(4) Tuck two folds closely over and around feet and ankles
(5) Open folds on second blanket about 2 feet from foot end
(6) After casualty is placed on litter, bring bottom of blanket up and over patient's feet
(7) Leave small fold between feet
(8) Tuck two folds closely over and around feet and ankles
(9) Wrap casualty with one side and then opposite side of first blanket



Dress with three blankets

(1) Place first blanket on litter lengthwise so that one edge is even with litter pole farthest from you
(2) The upper end of blanket is even with head of canvas
(3) Fold blanket back upon itself once, so that the folded edge is along litter pole near you and outer edge of blanket overhangs the other pole
(4) Place second blanket lengthwise over first one as described above, except start with opposite litter pole so that the blanket overhang is on opposite side of first blanket
(5) After casualty is placed on litter, fold third blanket once lengthwise and place it over casualty with one end under chin
(6) Fold overhanging edges of first two blankets over third blanket and secure them in place with safety pins, if available, or securing straps



Use of patient securing straps

Used after casualty is placed on dressed litter and covered

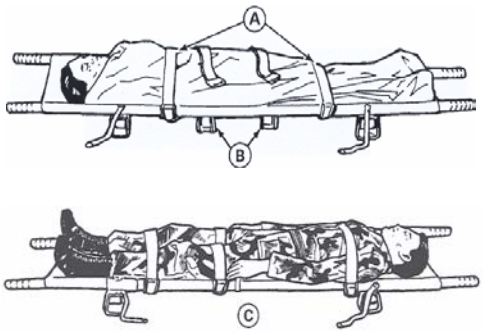
Used to hold casualty is position

Number of straps and body parts over which they should be placed depend upon type of terrain over which casualty is carried

(1) If two straps are necessary
  (a) Put one strap across chest and one across legs just below the knees
  (b) Extend straps under litter and buckle against litter pole

(2) If terrain is rough
  (a) Apply two additional straps
  (b) One placed across waist and other across thighs
  (c) Extend straps under litter and buckle them against litter pole

(3) If casualty is carried either up or down steep slopes
- (a) Use two additional straps
- (b) Secure each thigh to litter separately
- (c) Take one strap over one thigh, under other thigh, then under litter and buckle it against the litter pole
- (d) Take remaining strap and secure opposite thigh in same manner



Identify the general rules for litter bearers

General rules for litter bearers

(1) In moving a casualty, the litter bearers must make every movement deliberately and as gently as poss ble. The command STEADY should be used to prevent undue haste.

(2) The rear bearers should watch the movements of the front bearers and time their movements accordingly to ensure a smooth and steady action

(3) The litter must be kept as level as poss ble at all times, particularly when crossing obstacles, such as ditches

(4) Normally, the casualty should be carried on the litter feet first, expect when going uphill or upstairs; his head should then be forward. If casualty has a fracture of a lower extremity, he should be carried uphill or upstairs feet first and downhill or downstairs head first to prevent the weight of body from pressing upon injured part.

(5) When casualty is loaded on litter, his individual equipment is carried by two of the bearers or placed on litter

NOTE: For balance and support when lowering a litter, each bearer places free hand on other knee that remains in an upright position.

Use Spine Boards and the Kendricks Extrication Device (KED)

NOTE: Spine boards and the KED aid in rescuing and immobilizing casualties with known or suspected spinal fractures. Spine boards can be prefabricated from plywood or any suitable material.

Short spine board

(1) Casualty has a fracture or suspected fracture of neck
(2) Applied from waist up to immobilize upper spine before moving
(3) Bearers assemble required items:
  (a) Short spine board
  (b) Cervical collar
  (c) Two 6-foot patient securing straps
  (d) Cravat

NOTE: If an item is not available, the bearers should improvise it from any available material

Kendricks Extrication Device (KED)

(1) Prefabricated flexible type of short spine board
(2) Useful in extricating casualty suspected of having spinal injuries, especially if casualty is in the sitting position
  (a) Bearer 1 maintains inline stabilization until KED completely applied
  (b) Bearer 2 applies rigid cervical collar
  (c) Bearer 3 ties hands of casualty together and place casualty on long board

Long spine board

(1) Casualty has a fracture or suspected fracture of back as well as neck
(2) Bearers assemble required items
  (a) Long spine board
  (b) Four 6-foot patient securing straps
  (c) Cravat
  (d) Four pieces of padding

TERMINAL LEARNING OBJECTIVE

You encounter casualty(ies) that has/have been assessed and injury(ies) prioritized. A field medical card (FMC) has been initiated and attached to the casualties' uniform. Casualty(ies) require(s) evacuation to the next echelon of care.

Review Army Ground Ambulances and assigned medical personnel

General

(1) Ground ambulances are vehicles designed for or converted to carrying patients
- (a) They are dedicated assets to be used solely for the medical mission
- (b) They may be organic to the combat battalion in which the driver and aidman are assigned
- (c) These vehicles are equipped with a Medical Equipment Set designed for use in these ambulances, it consists of
  - (i) The Aidman's Aid Bag or CMVS
  - (ii) Long and short back boards, KEDs, and Cervical stabilization equipment
  - (iii) Supplemental Oxygen and suction equipment
  - (iv) Litters, patient securing straps and a blanket set
- (d) They are staffed with a driver/medical aidman and an additional medical aidman who are both qualified in basic EMT procedures
- (e) Track ambulances are staffed with three medical personnel (ambulance driver, track commander, and medical aidman)

Advantages

(1) They are co-located with maneuver elements and readily available when needed

(2) Operation is not limited by inclement weather

Responsibilities for loading

(1) Ambulance drivers are MOS qualified medics, their duties and respons bilities include but are not limited to the following:
- (a) Responsible for the ambulance at all times
- (b) Driver maintenance of the vehicle and reporting of major deficiencies to their section chief or supervisor
- (c) Providing emergency medical care as necessary
- (d) Providing maximum safety and welfare to the patients entrusted to their care
- (e) Ensuring the operational readiness and responsiveness of their vehicle and equipment
  - (i) Litters
  - (ii) Blankets
  - (iii) Splints
  - (iv) Medical expendables
  - (v) Oxygen canisters

(vi) Flashlights
(vii) Auxiliary fuel
(viii) Decontamination equipment
(ix) Special medical materials and equipment

(f) Ensuring they have the required information, tools, and equipment to navigate to the pick-up location. This includes:
(i) Maps
(ii) Map coordinates
(iii) Map overlays
(iv) Compass and position locator equipment such as GPS

(g) Preparing the ambulance for loading and unloading
(h) Assisting litter bearers in the loading and unloading of patients
(i) Performing property exchange when patients are loaded or unloaded
(j) Providing emergency transport of medical personnel, medical supplies, and blood and blood products
(k) Acting as a messenger in medical channels

(2) The medical aidman's duties and respons bilities include:
(a) Assistant driver
(b) Familiarity with the condition of each patient being transported and reviewing the information on the Field Medical Card (FMC)
(c) Coordination with the individual in charge for any special instructions in the care and treatment of patients en route
(d) Providing Emergency Medical Treatment as required
(e) Making periodic checks of patients while en route
(f) Supervising and assisting in loading and unloading of the ambulance
(g) Assisting the driver with land navigation and guiding the driver when backing or moving off roads, or when under blackout conditions

Ground Ambulances

(1) Vehicles designed or modified as ambulances include field (wheel) ambulances, and the M13 (track) armored personnel carrier
(a) Military field ambulances are designed for use by field units, they can operate on:
(i) Paved and secondary roads, trails, and cross country terrain
(ii) They must possess mobility and survivability comparable to the units being supported
(b) Current field ambulance variations include (These ambulances are normally used to evacuate patients from front line units to Battalion Aid Stations)
(i) Truck Ambulances, 4x4 utility HMMWV (M996 and M997) casualty carrying capacity

* M996: 2 litter or 6 ambulatory or 1 litter and 3 ambulatory
* M997: 4 litter or 8 ambulatory or 2 litter and 4 ambulatory

(ii) Carrier personnel, Full tracked, Armored, M113, T113E2 (when configured with a litter kit, an NBC kit, and an MES, is classified as a standard evacuation vehicle) carrying capacity
* 4 litter or 10 ambulatory or a combination of the two

Ambulance loading and unloading

(1) In loading and unloading ambulances litter casualties are moved carefully so as not to cause additional discomfort and or injury. Procedures may vary depending on the number of litter bearers, the presence or absence of a medical aidman, and the type of vehicle used

(a) General Procedures

(i) Casualties are normally loaded head first for the following reasons
* They are less likely to experience motion sickness or nausea
* They experience less noise from doors opening and closing
* Less danger of further injury in the event of a rear collision

(ii) When a casualty requires en route care
* For an injury to one side of the body it may be necessary to load the casualty feet first to make the injury readily accessible
* For casualties that require I.V. therapy a lower berth may be indicated in order to obtain a gravity flow
* Casualties with bulky splints may also require a lower berth (if poss ble)

(b) Instructional procedures: For loading and unloading ambulances

(i) Litter bearers are numbered

(ii) Formal commands are given so that each individual can learn his particular job and work as a team

(c) Loading procedures

(i) Loading Sequence for four litter casualties
* Upper right
* Lower right
* Upper left
* Lower left

(ii) The most seriously injured are loaded last so that they will be the first to be off-loaded

(iii) A three man squad is required to load and unload the ambulance

Review of medical air ambulances

General

(1) Aeromedical evacuation is accomplished by both helicopter and fixed wing aircraft

(2) Dedicated Aeromedical evacuation assets permit en route casualty care. This care minimizes further injury to the casualty and decreases mortality.

Advantages of Aeromedical evacuation

(1) The speed with which the casualty can be evacuated by air to a Medical Treatment Facility (MTF) ensures timeliness of treatment and contr butes to:
- (a) Saving lives
- (b) Reducing permanent disability
- (c) Increases the number of casualties returned to duty

(2) The range and speed of aircraft make it possible to evacuate casualties over long distances in short periods of time

(3) Helicopters can move casualties over terrain where evacuation by other means would be difficult if not impossible

(4) Because of speed, range, flexibility, and versatility of Aeromedical evacuation, casualties can be moved to MTFs best equipped to deal with their condition

(5) The selectivity of use of MTFs made possible by Aeromedical evacuation procedures permits
- (a) Economy in the use of these facilities
- (b) Fewer specialty treatment teams are required because Aeromedical evacuation assets allow the casualty to be evacuated directly to where they are located
- (c) Hospitals are required to move less often thereby reducing their periods of noneffectiveness during movement and reestablishment

Responsibilities for loading

(1) It is the respons bility of the commander who initiated the evacuation request to have the casualty delivered to the landing site for loading aboard the aircraft

(2) The actual loading is supervised by Aeromedical evacuation personnel

(3) The soldier medic on the ground will direct litter teams to move casualties in concept with the air ambulance crew member directing approach to and loading of the aircraft

Army Rotary Wing Air Ambulances

(1) Helicopters are rotary-wing aircraft that are capable of:
- (a) Horizontal flight

(b) Vertical flight
(c) Lateral flight
(d) Hovering flight

(2) Their ability to circumvent terrain and obstacles, and the minimum requirements for takeoff and landing enable them to operate from areas inaccess ble to fixed-wing aircraft or surface vehicles

(3) The helicopter's capability of flight at relatively slow speeds permits operations during periods of reduced ceiling and visibility

(4) Helicopters are organic to the air ambulance units and aviation units of the division and corps

(5) Military helicopters are designated by a combination of letters and numbers that are used to identify the basic mission and type:
(a) Observation helicopter (OH)
(b) Utility helicopter (UH)
(c) Cargo/transport helicopter (CH)

(6) The last two classes of helicopters can be used for the air evacuation of litter patients

(7) Army Medical air ambulances
(a) The UH-60A Blackhawk: This helicopter is used as the primary dedicated air ambulance
(i) Normal evacuation configuration
* Four litter patients and one ambulatory patient
(ii) Maximum evacuation configuration
* Six litter patients and one ambulatory patient
* Or seven ambulatory patients
(b) The UH-1H/V Iroquois: This aircraft also is used as a dedicated air ambulance
(i) Normal evacuation configuration
* Three litter and four ambulatory patients
(ii) Maximum evacuation configuration
* Six litter patients or nine ambulatory patients

Helicopter Landing Sites

(1) The unit requesting Aeromedical evacuation support is responsible for selecting and properly marking the helicopter LZ

(2) Criteria for Landing Sites
(a) The helicopter LZ and the approach zones to the area should be free of obstructions
(b) Sufficient space must be provided for the hovering and maneuvering of the helicopter during landing and takeoff
(c) The approach zones should permit the helicopter to land and take off into the prevailing wind whenever poss ble

(d) Landing sites should afford helicopter pilots the opportunity to make shallow approaches

(3) Definite measurements for LZs cannot be prescribed since they vary with
- (a) Temperature
- (b) Altitude
- (c) Wind
- (d) Terrain
- (e) Loading conditions
- (f) Individual helicopter characteristics

NOTE: The minimum requirement for light helicopters is a cleared area of 30 meters in diameter with an approach and departure zone clear of obstructions

(4) Removing or Marking Obstructions
- (a) Any object (paper, cartons, ponchos, blankets, tentage, or parachutes) likely to be blown about by the wind from the rotor should be removed from the landing area
- (b) Obstacles, such as cables, wires, or antennas at or near LZs, which cannot be removed and may not be readily seen by a pilot, must be clearly marked
- (c) Red lights are normally used at night to mark all obstacles that cannot be easily eliminated within a LZ

(5) In most combat situations, it is impractical for security reasons to mark the tops of obstacles at the approach and departure ends of a LZ

(6) If obstacles or other hazards cannot be marked, pilots should be advised of existing conditions by radio. In a training situation or at a rear area LZ, red lights should be used whenever poss ble to mark obstructions.

Identifying the Landing Site

(1) When the tactical situation permits, a landing site should be marked with the letter "H" or an inverted "Y, " using identification panels or other appropriate marking material

NOTE: Special care must be taken to secure panels to the ground to prevent them from being blown about by the rotor wash. Firmly driven stakes will secure the panels tautly; rocks piled on the corners are not adequate.

(2) If the tactical situation permits, the wind direction may be indicated by a Small wind sock or rag tied to the end of a stick in the vicinity of the LZ. The man standing at the upwind edge of the site with his back to the wind and his arm extended forward.

(3) Smoke grenades that emit colored smoke as soon as the helicopter is sighted. Smoke color should be identified by the aircrew and confirmed by ground personnel.

(4) In night operations. the following factors should be considered:

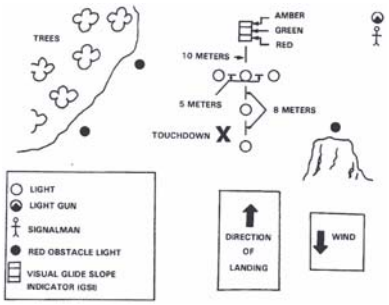
(a) One of the preferred methods to mark a landing site for aircrews using NVGs is to place a light such as an infrared chemical light at each of the four corners of the usable LZ

(i) These lights should be colored to distinguish them from other lights which may appear in the vicinity. A particular color can also serve as one element in identifying the LZ.

(ii) Flare pots or other types of open lights should only be used as a last resort. They usually are blown out by the rotor downwash. Further, they often create a hazardous glare or reflection on the aircraft's windshield.

(iii) The site can be further identified using a coded signal flash to the pilot from a ground operator. This signal can be given with the directed beam of a signal lamp, flashlight, vehicle lights, or other means.

(iv) When using open flames, ground personnel should advise the pilot before he lands. Burning material must be secured in such a way that it will not blow over and Start a fire in the LZ.



NOTE: Precautions should be taken to ensure that open flames are not placed in a position where the pilot must hover over or be within 3 meters of them.

(v) All lights are displayed for only a minimum time before arrival of the helicopter. The lights are turned off immediately after the aircraft lands. Blue and green light sources should only be used as a last resort; the filter on the NVGs may make them difficult to detect.

(vi) When standard lighting methods are not possible. pocket-sized white (for day) or amber (for night) strobe lights are excellent means to aid the pilot in identifying the LZ.

(vii) During takeoff, only those lights requested by the pilot are displayed; they are turned off immediately after the aircraft's departure.

(viii) When the helicopter approaches the LZ the ground contact team can ask the pilot to turn on his rotating beacon briefly. This enables the ground personnel to identify the aircraft and confirm its position in relation to the LZ.

Loading patients aboard rotary-wing aircraft

(1) Responsibility for Loading and Securing.

(a) The pilot is respons ble for ensuring that the litter squad follows the prescribed methods for loading and securing litters and related equipment.

(b) The final decision regarding how many patients may be safely loaded rests with the pilot.

(2) Guides for Loading Patients.

(a) Litter patients should be positioned in the helicopter according to the nature of their injuries or condition. Personnel aboard the aircraft supervise the loading and positioning of the patients. Normally, the helicopter has a crew of four. The crew consists of a pilot in command (PC), copilot (PI), crew chief, and flight medic.

(b) The most seriously injured patients are loaded last on the bottom pans of the litter support unit. However, if it is anticipated that a patient's medical condition may require in-flight emergency medical care (such as cardiopulmonary resuscitation), he should be loaded onto either of the top pans to facilitate access to him.

(c) The structuring of the litter support unit allows patients to receive IV fluids and oxygen in flight. Patients receiving IV fluids can be placed on any of the litter pans, depending on their injuries or condition.

(d) Patients in traction splits should be loaded last and on a bottom pan

(e) The UH-60A has the capability to be loaded on both sides simultaneously.

(f) Patients should be loaded so that upon rotating the litter support, the patient's head will be forward in the cabin. To accomplish this:

(i) patients loaded on the left side of the aircraft should be loaded head first

(ii) patients loaded on the right side of the aircraft should be loaded feet first

Safety Measures

(1) When loading and unloading a rotary-wing aircraft, certain precautionary measures must be observed

CAUTION: Failure to observe proper safety procedures could cause severe injury of death.

(2) Litter bearers must present as low a silhouette as poss ble and must keep clear of the rotors at all times
(3) The helicopter must not be approached until a crew member signals to do so
(4) The litter bearers should approach the aircraft at a 45-degree angle from the front of the helicopter
(5) If the helicopter is on a slope and conditions permit, loading personnel should approach the aircraft from the downhill side. Directions given by the crew must be followed, and litters must be carried parallel to the ground
(6) Smoking is not permitted within 50 feet of the aircraft

Non medical vehicles used for casualty evacuation or medical evacuation

General

(1) In combat areas, ambulances are often not available, are to few in number, or are incapable of evacuating casualties over certain types of terrain
(2) Many vehicles available to most units can be used to transport casualties with little or no change in their configuration
(3) Some amphibious cargo and personnel vessels can be used for this purpose; however, their casualty carrying capacity varies
(4) When casualties have entered the CHS system, they are classified as patients. Patient evacuation includes providing en route medical care to the patient being evacuated.
(4) A casualty moved on a non medical vehicle without en route medical care, is considered to be transported not evacuated

Casualty Transport and patient evacuation in a mass casualty situation

(1) To provide timely and responsive evacuation or casualty transport, CHS planners develop proactive Operation Plans (A Detailed plan of how the operation is to be conducted) to meet the challenges of mass casualty situations
  (a) Contingency plans should identify-
    (i) Non medical transportation resources
    (ii) Non medical personnel for litter teams
    (iii) Evacuation routes
    (iv) Ambulance exchange points
    (v) Medical personnel resources to provide en route medical care on non medical vehicles
    (vi) Capabilities and locations of MTFs
    (vii) Communications frequencies and call signs for C2
    (viii) Procedures for medical equipment exchanges
    (ix) Ground non medical assets, all available ground vehicles to augment the medical evacuation assets in an emergency

(x) Staffing of non medical vehicles with medical personnel
(xi) Management of patient evacuation

(2) Ground non medical assets that can be used for casualty transport (All available ground vehicles should be considered for use when medical evacuation assets are overwhelmed in emergency)
(a) Bradley infantry fighting vehicle, M2/3
(b) Truck, cargo, medium tactical vehicle (MTV), long wheelbase (LWB), 5 ton, M1085
(c) Truck, cargo 2 1/2 ton, M35
(d) Truck, cargo, heavy expanded, mobile tactical truck (HEMTT), 8x8, cargo, M997
(e) Truck, cargo, MTV, light vehicle air drop/air delivery (LVAD/AD), 5 ton M1093
(f) Truck, cargo, light medium tactical vehicle (LMTV), air drop/delivery, 2 1/2 ton, M1081
(g) SemiTrailer, Cargo, 22 ½ Ton, M871
(h) Armored personnel carrier, M113
(i) Tractor, 5 ton, with stake and platform trailer
(j) High-mobility, multipurpose wheeled vehicle, M998

United States Army and Air Force Medical and Non medical Aircraft

The US Army has both fixed-wing and rotary-wing aircraft. These aircrafts are employed in both the combat zone and echelons above the Corps level.

(1) Army Fixed-Wing Aircraft: The capability of Army fixed-wing aircraft to land on and take off from selected small, unprepared areas permits the evacuation of patients from Areas of Operations which would be inaccessible to larger aircraft
(2) These aircraft can fly slowly and maintain a high degree of maneuverability
(3) This capability further enhances their value in forward areas under combat conditions
(4) Army fixed-wing aircraft are limited in speed and range as compared with larger transport-type aircraft
(5) When adequate airfields are available, fixed-wing aircraft may be used in forward areas for patient evacuation

NOTE: This is a secondary mission for these aircraft which will be used only to augment dedicated air ambulance capabilities.

Types of Army fixed-wing non-medical aircraft suitable for patient evacuation

(1) The U-21 Ute and C-12 Huron are used as utility (U-21) and passenger/cargo (C-12) aircraft. These aircraft are not normally employed as evacuation aircraft. In emergency situations, both of these aircraft can be configured to evacuate litter and ambulatory patients

(a) The U-21 Ute is a twin turbine, propeller-driven utility aircraft with a normal cruise speed of 210 knots and an endurance of over 5 hours flying time. It is capable of accommodating ten ambulatory patients, or three litter patients plus three ambulatory patients and a medic

(b) The C-12 Huron is the newest addition to the Army's fixed-wing aircraft inventory. Depending on the model, its normal cruise speed ranges from 240 to 260 knots with 5 to 6 hours endurance. It is capable of carrying eight ambulatory patients, or two litter and four ambulatory

Loading Patients Aboard Army Fixed-Wing Aircraft

(1) The personnel who transport patients to the landing strip load the patients aboard the aircraft

(2) They may be required to assist in configuring the aircraft for litters

(3) Litters are generally loaded from the top downward and from the front to the rear

(5) The four-man litter squad plus the crew chief normally load these aircraft

The crew chief or another member of the aircraft crew supervises the loading of all patients. Bearer number 2 normally enters the aircraft to assist the crew chief in loading the litters

Army rotary-wing non-medical aircraft suitable for patient evacuation

(1) The CH-47 (Chinook) helicopter, has a capacity of 24 litter patients, or 31 ambulatory patients, or a combination of litter and ambulatory patients

(2) The aircraft's overall size and rotor blade diameter make it unsuitable for use in smaller or more confined areas

NOTE: The CH-47 helicopter should not be brought into a LZ that is smaller than 40 meters in diameter.

Loading Patients Aboard the CH-47 (Chinook)

(1) This helicopter's maximum capacity is 24 1itter patients or 31 ambulatory patients. The 31 ambulatory patients are seated in the ten 3-man seats and the 1-man seat as shown in Figure 10-42 of FM 8-10-6. The two 1-man seats are used by crew members.

(2) When carrying 24 litter patients, the seats are replaced with six tiers of litters, four litters high. The two 1-man seats in the rear section should remain in place for the crew members. The 1-man seat at the left front may also be left in place provided it is needed.

(3) The combinations of litter and ambulatory patients the CH-47 is capable of accommodating are provided in Table 10-5 of FM 8-10-6

In order to accommodate litter casualties the CH-47 must be re-configured using specially designed litter support kits

(1) Litter Support Kits. These kits are available for use in adapting the helicopter's interior to evacuate litter patients.

(2) These kits contain 12 litter poles, stored in the front of the cargo compartment and 12 litter traps, stored in overhead recesses.

(3) The poles contain safety attachments for securing them along the side walls of the compartment. The pull-down straps on the aisle side are secured to floor studs.

(4) Permanently attached to each litter pole and each strap are four litter support brackets with locking devices for securing litter handles in place

(6) It is not necessary to remove the seats before adapting the compartment for litter patients. The seats can be folded against the wall and strapped in place.

Loading of Litter Patients. The loading of litter patients aboard the CH-47 helicopter is similar to loading patients aboard the UH-1HN air ambulance except the litter squad is not assisted by the crew members.

(1) In a 2-man carry, the litter squad carries each litter patient through the lowered rear door and ramp to the litter rack where he is to be placed

(2) The squad then moves into a 4-man carry and places the litter patient into the appropriate tier

(3) The litter racks should be loaded from front to rear and from top to bottom

(4) Litter patients requiring in-flight medical care should be positioned to facilitate this care. If the helicopter is to be loaded with a combination of litter and ambulatory patients, the litter patients should be positioned to the rear of the ambulatory patients whenever possible.

Air Force aircraft: Most USAF cargo aircraft can be used for AeroMedical Evacuation(AE). The aircraft used for forward airlift movement of troops and supplies may be reconfigured for the AE mission on the return flight (provided proper equipment is available).

(1) However, more likely USAF AE will be accomplished by dedicated (aircraft identified for AE only) or designated (mission scheduled specifically for AE) AE aircraft

(2) The flex bility and responsiveness provided to AE by designated or dedicated AE missions also improves cargo and passenger airlift

throughput by not pulling scheduled cargo missions from their scheduled routes to support AB

Types of Air Force Transport Aircraft

(1) The C-130 Hercules Transport. This aircraft is a four-engine, turbo-propeller driven aircraft with a pressurized, air-conditioned cabin and a self-contained loading ramp.
- (a) In the normal patient configuration, this aircraft can accommodate 50 litter and 27 ambulatory patients
- (b) This can be varied for as many as 70 litters with no ambulatory patients, or 85 ambulatory patients with no litters
- (c) These figures represent maximum patient capacity and would not be used routinely
- (d) The medical crew is normally provided by the USAF. It consist of:
  - (i) Two flight nurses
  - (ii) Three AE technicians
- (e) The C-130 can land on and take off from short, austere runways
- (f) It can also be used on landing strips such as those found in forward base operations. Its normal use is within a TO for tactical and assault airlift
- (g) The ambulance bus maybe backed up to the ramp at the tail of the aircraft for easy enplaning of litter patients
- (h) The C-130 can also be used for inter-theater airlift missions

(2) The C-9A Nightingale. This aircraft is a T -tailed aeromedical airlift with two jet engines and a pressurized, air-conditioned cabin.
- (a) The Nightingale is the military version of the DC-9 airliner with an interior specifically designed for in-flight patient care
- (b) It is the only aircraft in the USAF inventory that is dedicated to the medical evacuation mission
- (c) It has a self-contained patient enplaning ramp and can accommodate 40 litter patients, 40 ambulatory patients, or a combination of both
- (d) The ambulance bus maybe backed up to the ramp at the tail of the aircraft for easy enplaning of litter patients
- (e) This aircraft can operate from and between CZ, BAC, or CONUS from improved mile long runways
- (f) The medical crew normally consists of:
  - (i) Two flight nurses
  - (ii) Three AB technicians

(3) The C-141 Starlifter. This aircraft is a four-engine, jet cargo transport aircraft. The cabin is pressurized, heated, or cooled, as required
- (a) The ambulance bus may be backed to the ramp at the tail of the aircraft for easy planing of litter patients

(b) The C-141 can accommodate 103 litter patients, 147 ambulatory patients, or a combination of both
(c) Normally, the aircraft will be configured to accommodate 48 litters and 38 seats. Maximum capacity is not routinely used, as crowding detracts from patient care.
(d) The usual medical crew consists of
(i) Two flight nurses
(ii) Three AE technicians
(e) The C-141 is used for all missions of the AMC intertheater AB system. With the backhaul capacity, these intercontinental cargo aircraft provide AE from a TO to CONUS

(4) The C-5 Galaxy .The C-5 is the US's largest aircraft. The aircraft is normally a cargo mover, with a payload of over 200,000 pounds.
(a) If required, it could carry up to 70 ambulatory patients in its upper- aft passenger compartment in addition to its cargo load
(b) This aircraft is considered an aircraft of opportunity and is only used if absolutely necessary

(5) The C-17A. This aircraft is a four-engine, jet driven aircraft with a pressurized, air-conditioned cabin and a self-contained loading ramp.

(a) In the normal patient configuration, this aircraft can accommodate 36 litter and 54 ambulatory patients. These figures represent maximum patient capacity.
(b) The medical crew is provided by the USAF. It consists of:
(i) two flight nurses
(ii) three AE technicians
(c) The C-17 A can land and take off from short, austere runways. It can also be used on landing strips such as those found in forward base operations.
(d) When available, the ambulance bus may be backed to the ramp at the tail of the aircraft for easy enplaning of litter patients
(e) The C-17 A can also be used for both intratheater and intertheater airlift missions

(6) The KC-135 and KC-I0. These aircraft are four-engine, jet driven aircraft with a pressurized, air-conditioned cabin.
(a) In the normal patient configuration, this aircraft can accommodate 8 litters and 24 ambulatory patients
(b) The litter patients would be loaded and secured to the floor of the aircraft for transport
(c) Because these aircraft do not have loading ramps, either a ramp or cargo loader must be used to load and unload patients
(d) The medical crews are provided by the USAF

Appendix A
Evacuation Request Procedures
Competency Skill Sheets

Evacuation Request Procedures

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Collected all information needed for the MEDEVAC request line items 1 through 9.	P / F	P / F	P / F
b.	Recorded the information using authorized brevity codes, as appropriate.	P / F	P / F	P / F
c.	Contacted the unit controlling evacuation.	P / F	P / F	P / F
d.	Stated the purpose of the radio message in clear text. (1) State, "I have a MEDEVAC request, over." (2) Wait 1 to 3 seconds for acknowledgment, if there is no answer or if contact is interrupted, repeat the statement.	P / F	P / F	P / F
e.	Transmitted the MEDEVAC request information within 3 minutes. (1) The request included all needed information in the proper sequence for transmission. (2) Corrected brevity code items are used. (3) Letters and numbers pronounced IAW appropriate radio telephone procedures. (4) Followed the procedure in the "explanation" column to transmit other required information. (5) Ended the transmission by stating, "Over," and listened for acknowledgement.	P / F	P / F	P / F
f.	Kept the radio on and listened for additional instructions or contact from the evacuation unit.	P / F	P / F	P / F

Instructor Comments:

Appendix B
Perform Casualty Triage
Competency Skill Sheets

Triage

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____

Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Combat medic examined each patient (1) Conducted quick visual examination (2) Determined which patients are most seriously ill or injured	P / F	P / F	P / F
b.	Combat medic treated the most seriously ill or injured first (1) Re-examined their general condition, types of injuries, and need for immediate lifesaving measures (2) Conducted complete enough examination to identify injury or illness, determined priority and type of treatment. Initiated lifesaving treatment as condition indicates	P / F	P / F	P / F
c.	Combat medic re-examined each patient (1) Re-examined after all patients have been examined for life-threatening injuries and lifesaving treatment (2) Re-examined for extent of injury or previous non-apparent injury (3) Determined treatment needs	P / F	P / F	P / F
d.	Combat medic requested patient evacuation (1) Requested additional evacuation support as needed (2) Established priority for evacuation based on patient category, load, and vehicle availability	P / F	P / F	P / F

Instructor Comments:

Appendix C
Manual Evacuation
Competency Skill Sheets

Fireman's Carry

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Soldier positioned properly (1) Kneeled at casualties uninjured side (2) Casualties arms placed above his/her head (3) Soldier placed casualties ankle furthest from him over ankle closest to him (4) Soldier placed his one hand on the shoulder farthest from him and the other hand on hip or thigh	P / F	P / F	P / F
b.	Soldier positioned casualty (1) Casualty rolled toward soldier onto abdomen (2) Soldier straddled casualty (3) Soldier placed hands under casualties chest and locked them together (4) Soldier moved backward to raise/lift casualty to knees (5) Soldier continued backward to straighten casualties legs until knees locked (6) Soldier moved forward to place casualty in a standing slightly backward leaning position (7) Soldier maintained support of casualty with one hand. (8) Soldier quickly gasp he casualties wrist with free hand and lifted arm high (9) Soldier placed his head under his raised arm, releasing it as he passed under it (10) Soldier moved quickly to face casualty and secure arms around waist (11) Soldier placed foot between casualties feet and spread them 6-8 inches apart (12) Soldier gasp casualties wrist and raised arm high over head	P / F	P / F	P / F
(d)	Soldier lifted casualty (1) Soldier stooped down and pulled casualties arm over and down over shoulder (2) Brought casualties body across soldier's shoulders and passed arm between casual ies legs (3) Soldier grasped casualty's wrist with one hand and the other on his knee for support (4) Soldier stood with casualty correctly positioned.	P / F	P / F	P / F

Instructor Comments:

One-man Support Carry

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Soldier positioned properly	P / F	P / F	P / F
	(1) Kneeled at casualties uninjured side			
	(2) Casualties arms placed above his/her head			
	(3) Soldier placed casualties ankle furthest from him over ankle closest to him			
	(4) Soldier placed his one hand on the shoulder farthest from him and the other hand on hip or thigh			
	(5) Casualty rolled toward soldier onto abdomen			
	(6) Soldier straddled casualty			
	(7) Soldier placed hands under casualties chest and locked them together			
	(8) Soldier moved backward to raise/lift casualty to knees			
	(9) Soldier continued backward to straighten casualties legs until knees locked			
b.	Soldier provided support	P / F	P / F	P / F
	(1) Soldier raised conscious casualty to standing position			
	(2) Soldier grasped the casualty's wrist			
	(3) Soldier drew casualty's arm around his neck			
	(4) Soldier placed his arm around casualty's waist			

Instructor Comments:

Saddleback Carry

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____

Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Soldier positioned properly	P / F	P / F	P / F
	(1) Kneeled at casualties uninjured side			
	(2) Casualties arms placed above his/her head			
	(3) Soldier placed casualties ankle furthest from him over ankle closest to him			
	(4) Soldier placed his one hand on the shoulder farthest from him and the other hand on hip or thigh			
	(5) Casualty rolled toward soldier onto abdomen			
	(6) Soldier straddled casualty			
	(7) Soldier placed hands under casualties chest and locked them together			
	(8) Soldier moved backward to raise/lift casualty to knees			
	(9) Soldier continued backward to straighten casualties legs until knees locked			
b.	Soldier positioned casualty	P / F	P / F	P / F
	(1) Soldier supported casualty by placing arms around waist			
	(2) Soldier moved to front of casualty			
	(3) Soldier had casualty place encircle arms around soldier's neck and shoulders and lock hands			
	(4) Soldier grasp casualties upper arm with hands while supporting casualty and executed an about face and grasped casualties arm with his hand			
	(5) Soldier stooped and raised casualty onto his back			
	(6) Soldier clasp hands together beneath thighs if required, while casualty holds onto shoulders			

Instructor Comments:

Two Man Seat Carry

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Soldier positioned properly	P / F	P / F	P / F
b.	Placed casualty in a supine position	P / F	P / F	P / F
c.	Bearers kneeled on opposite sides of the casualty	P / F	P / F	P / F
d.	Bearers used hand furthest from the casualty's head to reach and grasp the casualty's shoulder nearest them	P / F	P / F	P / F
e.	Bears used free hand to support the casualty's head	P / F	P / F	P / F
f.	Bearers brought casualty to a sitting position	P / F	P / F	P / F
g.	Bearers moved hands from behind casualty's head to behind casualty's back	P / F	P / F	P / F
h.	Bearers interlocked hands behind casualties back	P / F	P / F	P / F
i.	Bearers extend casualty's arms and placed them over and behind bearers arms	P / F	P / F	P / F
j.	Each bearer placed his hand under the casualty's knees and interlocks hands	P / F	P / F	P / F
k.	Bearers stood upon command	P / F	P / F	P / F
l.	Bearers demonstrated good body mechanics	P / F	P / F	P / F

Instructor Comments:

Neck Drag

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Soldier tied casualty's together at waist			
b.	Soldier allowed conscious casualty to clasp his hands around soldier's neck			
c.	Soldier straddled casualty in a kneeling face-to-face position			
d.	Soldier looped casualty's hands around his neck			
e.	Soldier crawled and looked forward dragging the casualty with him			
f.	Soldier protected the unconscious casualty's head from ground			

Instructor Comments:

Two Man Fore and Aft Carry

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	First bearer (1) Casualty placed in a supine position (2) First bearer approached casualty from head and kneeled down on one knee and raised casualty to sitting position (3) Bearer one passed his hands under the casualty's arms and interlocked them in front of the casualty's chest	P / F	P / F	P / F
b.	Second bearer (1) Approached casualty from feet (2) Legs of the casualty spread apart (3) Second bearer executed an about face, kneeled to one knee (4) Bearer encircled the casualty's knees in his hands	P / F	P / F	P / F
c	Bearers lifted casualty (1) Upon command "Lift", both bearers stood up (2) Bearers used reverse procedure to place casualty on the ground or litter.	P / F	P / F	P / F

Instructor Comments:

Four Hand Seat Carry

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Bearers (1) Considered four hand seat carry when hand or foot injuries were present (2) Assured casualty is conscious	P / F	P / F	P / F
b.	Bearer positioned (1) Each bearer grasped his left wrist with right hand (2) Bearers face each other (3) Bearers grasp each others wrist with left hand	P / F	P / F	P / F
c	Bearers instructed casualty (1) Sit on seat formed by bearer's hands (2) Instructed to support himself by encircling bearer's shoulders (3) Bearers used the reverse procedure to place casualty on the ground or on a litter	P / F	P / F	P / F

Instructor Comments:

Appendix D
Litter Evacuation
Competency Skill Sheets

Litter Evacuation Procedures

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Soldier medic coordinated with platoon company headquarters regarding (1) Special equipment or personnel requirements (2) Verification of evacuation routs (3) Tactical situation in rout to the site and tactical situation on site (4) Location of possible collection points (5) Location of most critically wounded (6) Number and type pf casualties	P / F	P / F	P / F
b.	Soldier medic assisted in establishing a collection point (1) Secured site with driver and other available personnel (2) Parked vehicle facing enemy (doors to the rear) (3) Litter teams established and aid men assigned to teams or casualty sites (4) Casualties surveyed at initial site to establish evacuation priority	P / F	P / F	P / F
c.	Soldier medic assisted in operating the casualty collection point (1) Surveyed patients to determine further evacuation priority, and provided necessary treatment prior to evacuation (2) Identified casualties who have been contaminated (3) Ensured Field Medical Card is complete and attached (4) Loaded casualties into vehicle according to priority of treatment	P / F	P / F	P / F
d.	Soldier medic contacted commander or senior aidman and receiving aid station at time of departure and at stated ETA	P / F	P / F	P / F
e.	Moved with platoon along prescribed movement routs, taking advantage of cover and concealment	P / F	P / F	P / F
f.	Assisted medical platoon leader operational intelligence of the battle area provided by platoon	P / F	P / F	P / F

Instructor Comments:

Improvised Litters

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Soldier gathered and assembled materials to make an improvised pole and poncho litter (1) Soldier medic opened poncho fully (2) Spread poncho on the ground with hood and drawstring up (3) Laid one pole lengthwise across center, folded poncho over in half (4) Placed second pole at the center of the folded poncho Folded free edges of poncho over second pole (5) Casualty's weight locked the poncho in place	P / F	P / F	P / F
b.	Soldier gathered and assembled materials to make an improvised pole and jacket litter (1) Buttoned or snapped all buttons and snap on two jackets or shirts (2) Turned the sleeves Inside the body of the jackets (3) Buttoned the two jackets or shirts together at the lapels (4) Laid the jacket or shirt on the ground wit the buttons or snaps toward the ground (5) Placed a litter pole through each sleeve, starting at the shoulder of one jacket, going all the way through to the end of the pole, then coming back through the other jacket sleeve	P / F	P / F	P / F
c.	Soldier gathered and assembled materials to make a pole and sack litter (1) Soldier medic took the closed end of a sack and cut holes in the corner large enough to slide a litter pole through (2) Placed two sacks open end to open end flat on the ground (3) Placed two poles through the large openings starting at the center of one sack going all the way through to the end of the pole, then came back through o other sack (4) Soldier medic overlapped the two open ends of the sacks approximately 3 inches at the center of the litter	P / F	P / F	P / F
d.	Soldier gathered and assembled materials to make a poncho litter without poles (1) Soldier medic spread a poncho flat on the ground or floor (2) Placed the casualty across the center of the poncho (3) Instructed bearers to roll tightly from both ends toward the casualty (4) Instructed bearers to place their hands as close to the casualty as possible and to support the head and neck when lifting.	P / F	P / F	P / F

Instructor Comments:

Four Man Carry

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Acting as team leader, the soldier medic positioned one bearer at each corner of the litter	P / F	P / F	P / F
b.	Leader gave the commands "Prepare for lift, Lift“ team members bent down placing the knee closest to the litter on the ground	P / F	P / F	P / F
c.	Team members placed the hand closest to the litter on the handle	P / F	P / F	P / F
d.	Team members placed their free hand on their up knee for support	P / F	P / F	P / F
e.	Litter was raised in a smoothly on the command :“Lift“	P / F	P / F	P / F

Instructor Comments:

Litter Post Carry

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Acting as team leader soldier medic commands, "Litter-post, carry, move!“	P / F	P / F	P / F
b.	One designated member of the bearer team at each end of the litter grasp both handles	P / F	P / F	P / F
c.	Freed member from each end of the litter moves to the center of the pole on each side of the casualty facing each other and grasp the pole.	P / F	P / F	P / F
d.	Team leader commanded "Prepare to rotate, Rotate“	P / F	P / F	P / F
e.	Bearers at the ends of the litter released the litter	P / F	P / F	P / F
f.	Members on the sides of the litter rotated 180^0 counter clockwise	P / F	P / F	P / F
g.	Once litter was rotated members at the end of the litter resumed their positions with both hands on the litter handles	P / F	P / F	P / F

Instructor Comments:

Uphill/Downhill Carry

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Soldier medic assembles four member bearer team for uphill (upstairs carry) (1) Acting as team leader soldier medic commands, „Uphill, carry, move!“ (2) One designated member of the bearer team proceeded the litter (3) One designated member of the bearer team was designated to carry the front of the litter (4) The other team members were designated to carry the rear of the letter, one on each handle			
b.	Soldier medic assembles four member bearer team for downhill (downstairs carry) (1) Acting as team leader soldier medic commands, „Downhill, carry, move!“ (2) One designated member of the bearer team at the head of the casualty grasp both handles (3) Two designated member of the bearer team at the feet of the casualty grasp the handles with both hands (4) The team leader proceeded the team and braced the two bearers at the foot of the litter			

Instructor Comments:

Low Crawl

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Acting as team leader soldier medic commands, "Low crawl, move!“	P / F	P / F	P / F
b.	Team members at each end of the litter moved to their knees and elbows	P / F	P / F	P / F
c.	Leader commands, "Ready, lift!“	P / F	P / F	P / F
d.	In unison members raise litter and moved it forward 6 to 8 inches and then lowered It gently	P / F	P / F	P / F
e.	Members crawled forward and repeated lift and lowering procedure	P / F	P / F	P / F
f.	Members returned to their original positions on the command, "Prepare to lift, lift!“	P / F	P / F	P / F

Instructor Comments:

Overhead Carry

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Soldier medic assembles four person bearer team			
	(1) Acting as team leader soldier medic commands, "Overhead, carry, move!“			
	(2) Leader instructed team members at each end of the litter to face each other across the litter			
	(3) Team leader determined who the taller member is at each end of the litter			
	(4) Leader instructed the taller member at each end to go between the litter handles and place their hands as close to the litter canvas as possible			
	(5) Leader instructed the shorter member at each end to move under the litter and grasp the litter poles between the stirrups and handles			
	(6) Leader insures all members are faced in the same direction			
b.	Soldier medic recovers four person bearer team			
	(1) Leader commands, "Four-man carry, move“			
	(2) Shorter individuals returned to their original handles			
	(3) Taller individuals returned to their original handles			
	(4) On the command of execution, the litter was lowered and kept level			

Instructor Comments:

Appendix E
Evacuation Platforms
Competency Skill Sheets

Ambulance Evacuation Platforms

Soldiers Name: _____ SSAN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

	1st	2nd	3rd
a. Soldier medic assembles a four man bearer team (1) Acting as team leader soldier medic positioned one bearer at each corner of the litter (2) Leader gave the commands „Prepare to lift, Lift“ team members bent down placing the knee closest to the litter on the ground (3) Team members placed the hand closest to the litter on the handle (4) Team members placed their free hand on their up knee for support (5) Litter was raised smoothly on the command:“ Lift“	P / F	P / F	P / F
b. Soldier medic assured that casualty was moved carefully to ambulance (1) Unless nature of injury indicated otherwise, soldier medic assured that casualty was loaded head first (2) Casualties with wounds of the chest or abdomen, or receiving IV fluids were loaded on lower berths (3) Casualties wi h bulky splints were placed on lower berths if possible (4) Assured that he most seriously injured casualties are loaded last (5) For loading four casualties used the berth sequence upper right, lower right, upper left, and lower left (6) For unloading four casualties used reverse ber h sequence lower left, upper left, lower right, and upper right	P / F	P / F	P / F
c. When M996 or M997 is used soldier medic assured that casualty was moved carefully to the platform (1) Soldier medic as team leader reviewed the two and four litter configurations for the M996 or M997 (2) With the two-litter configuration of the M996 the soldier medic loaded the right berth and then the left	P / F	P / F	P / F
d. When M996 or M997 is used soldier medic assured litter rails were assembled (1) From the litter rail extension stowage compartment the latch was turned counter clockwise to open door (2) Securing straps were loosened and disconnected (3) Folded litter rail was removed form stowage compartment (4) Left and right rails were pulled apart allowing the legs to lie flat on the ground (5) Support braces were locked and straps adjusted as needed	P / F	P / F	P / F
e. Soldier medic ensured straps and equipment did not inhibit litter loading operations. Litters were loaded carefully to prevent further injury. (1) Both rails of litter rail extension were secured into slots on litter rack	P / F	P / F	P / F

	(2) Litter placed safely on litter rail extension (3) Litter slid onto litter rack (4) Litter secured onto rail with front and rear litter handle straps			
f.	Soldier medic ensured straps and equipment did not inhibit litter unloading operations. Litters were unloaded carefully to prevent further injury. (1) Released front and rear litter handle straps which secure litter to litter rack (2) Secured both rails of litter rail extension into slots on lower litter rack (3) Slid litter from lower rack onto litter rail extension (4) Bearer team lifted up and removed litter from litter rail extension (5) Litter rail extensions were folded and stowed away	P / F	P / F	P / F
g.	Soldier medic opened/closed seats to accommodate ambulatory casualties (1) Ensured litters are in stored position (2) Pulled out and up on seat latch to remove latch from catch (3) Lifted seat back to open position and folded seat back support recesses between seat cushions (4) Ensured seat braces are fully extended and locked into position (5) When closing seats pressed lock buttons on seat braces and folded braces toward seat back (6) Folded seat back support outward and folded seat back into closed position (7) Ensured guide pins on seat back support engaged holes in seat base (8) Installed seat back to base with seat latch and secured with latch handle.	P / F	P / F	P / F
h.	When loading the four-litter configuration on the M997, used the loading sequence upper right, lower right, upper left, and lower left (1) Assured the most seriously injured casualties are loaded last (2) Used the reverse sequence for unloading lower left, upper left lower right, and upper right (3) When only tow berths were used loaded on he upper and lower right side (4) Soldier medic did not unload previously loaded patients on subsequent stops to maintain most seriously injured sequence	P / F	P / F	P / F
i.	Soldier medic prepared upper litter rack (1) Unhooked tension strap from footman loop on lower rack (2) Pulled out upper litter rack handle and supported weight of upper liter rack (3) Unhooked lower suspension strap hook from loop on upper litter rack and clipped suspension strap hook to eye (4) Released litter support latch stop and pushed latch in and lowered upper litter rack onto lower litter rack (5) Slid litter rack handle into upper litter rack	P / F	P / F	P / F
	j. Soldier medic leads loading/unloading on upper rack (1) Assembled litter rail extension	P / F	P / F	P / F

	(2) Secured both rails of litter extension into slots of upper litter rack (3) Placed litter on litter rail extension (4) Slid litter up rails until litter was clear of litter rail extension (5) Secured rear litter handles to upper litter rack with rear litter handle straps (6) Removed litter rail extensions from upper litter rack (7) Unhooked suspension straps hook from eye (8) Pulled out upper litter rack handle (9) Raised upper litter rack and pushed into support latch and secured with stop (10) Attached suspension strap hook to loop on upper litter rack (11) Secured front litter handles to litter rack wi h front litter handle straps (12) Hooked tension strap to footman loop on lower litter rack and adjusted strap (13) Slid litter rack handle into upper litter rack (14) When unloading, released front litter straps from litter handle (15) Unhooked tension strap from footman loop on lower rack (16) Pulled out upper litter rack handle and supported weight of upper litter rack (17) Unhooked rear suspension strap hook from the loop on the upper rack (18) Released litter support latch stop by pushing latch in and lowered upper litter rack onto lower rack (19) Slid litter rack handle into upper litter rack (20) Secured rails of litter rail extension into slots of upper litter rack (21) Released rear litter handle straps from litter handles (22) Slid litter down litter rail extension until litter was clear of upper litter rack (23) Lifted and removed litter from litter rail extension (24) Removed and stowed litter rail extension from upper rack			
k.	Soldier medic leads loading/unloading on lower rack (1) Secured both rails of litter rail extension into slots on lower litter rack (2) Placed litter on litter rail extension (3) Slid litter on to lower litter rack (4) Secured litter to lower rack with front and rear litter handle straps (5) When unloading, released front and rear litter straps securing litter to rack (6) Secured both rails of litter rail extension into slots on lower rack (7) Slid litter from lower rack onto litter rail extension (8) Lifted up and removed litter form litter rail extension	P / F	P / F	P / F

Instructor Comments:

Helicopter Evacuation Platform

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

	1st	2nd	3rd
a. Soldier medic assembles a four man bearer team to load helicopter (1) Acting as team leader directed team members to present a low silhouette as possible when approaching the helicopter (2) Directed team members to stay clear of the rotors and not to smoke within 50 feet (3) Soldier medic waited for and followed signals from aircraft crew before advancing (4) Bearer team approached aircraft at a 45° angle from the front of the helicopter (5) If conditions permit the helicopter is approached from the downhill side (6) Litters were carried parallel to the ground	P / F	P / F	P / F
b. When loading a UH-60A Blackhawk (1) Directed the loading of up to six ambulatory patients on the litter support unit, three on each side and a seventh on the troop seat (2) Reviewed Patient configuration restraints for a UH-60A Medical Kit and UH-60A Medical Kit with internal rescue hoist (3) Most seriously injured patients were loaded last on the bottom (4) Patients anticipated to require in rout emergency care were placed onto one of the top pans to facilitate access (5) Patients in traction splints loaded last when time and situation permits	P / F	P / F	P / F
c. Loading upper litters (1) For ease of loading upper litter pan's end shaft was disengaged and pan was tilted (top pan does not tilt if loading six patients) (2) When loading four litters with a four person team, litters were loaded from top to bottom (3) When loading patients from one side with the carousel turned used the sequence upper right, upper left, lower right, and lower left (4) When loading from both sides of the aircraft used sequence upper and the lower (5) Litter support unit was turned 90° clockwise to receive litter patients (6) Bearers moved into semi-overhead carry, lifting litter just high enough for the litter stirrups of one end to slide into the pan (7) Bearers slide litter forward until stirrups on both ends are secure in the pan (8) Flight crew raised pan to upright position and secured straps, bearers depart for next patient (9) Second, third and fourth patients are loaded in the same manner, except bottom pans are not tilted (10) After loading all four patients the litter support unit was turned 90° clockwise and locked into flight position (11) If patients five and six are being loaded the restraint modification kit was installed. The last two litters were	P / F	P / F	P / F

	side loaded between the restraints, with the patient's head toward the front of the aircraft and secured (12) Cargo doors closed for flight (13) The aircraft was unloaded in the reverse order of loading			
d.	When loading a UH-1H/V Iroquois (1) Directed the loading of up to six litter or nine ambulatory patients (2) Litters were loaded lengthwise on up to three tiers (3) Reviewed normal configuration of three litter patients loaded crosswise and four ambulatory patients (4) Patients were loaded from the top tier down with the most seriously injured being loaded last (5) Litter patients receiving IVs were not placed on top tier and as low as possible in the litter rack (6) Patients with Hare traction splints with supports and footrests were loaded last and placed on the floor of the aircraft	P / F	P / F	P / F
e.	Loading and securing patients (1) When loading six litter patients with a four bearer team, helicopter was loaded from both sides and from top to bottom (2) When mixed loading three litters were loaded crosswise and four ambulatory soldiers were seated in side seats (3) When loading from the left, the bearer team moved to the side of the helicopter with the litter perpendicular to the cargo compartment (4) The bearer team moved into the litter post carry position (5) Bearers 1 and 3 give there litter handles to the crew members (6) Bearers 2 and 4 secure the foot of the litter (7) Ambulatory patients were loaded after all litter patients (8) The aircraft was unloaded in the reverse order of loading	P / F	P / F	P / F

Instructor Comments:

91W10
Advanced Individual Training Course

Force Health Protection Handbook

Department of the Army
Academy of Health Sciences
Fort Sam Houston, Texas 78234

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Appendix A – Assemble a Needle and Syringe and Draw Medications, Competency Skill Sheets

Appendix B – Administer Intramuscular, Subcutaneous and Intradermal Injections, Competency Skill Sheets

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked Combat Medic Vest System (CMVS) or fully stocked M5 Bag, and personal chemical protective equipment. You are tasked to inspect a company size area of occupation to ensure medical force protection measures are being carried out. Performed appropriate identification of medical force protection issues. Perform appropriate intervention for maintenance and treatment of company area of occupation.

Importance of the Field Sanitation Team

Importance of the Field Sanitation Team

(1) Field sanitation team (FST) is responsible for preventive medicine measures (PMM) that affect units
(2) Unit effectiveness dependent upon the health of its soldiers

The Role of the Soldier Medic

(1) Perform and maintain field hygiene and sanitation
(2) Promote good personal hygiene
(3) Disinfection of water
(4) Prevention and elimination of deficiencies in food service sanitation
(5) Construction of garbage and soaking pits
(6) Construction of field latrines and urinals

Medical Threat

Impact of casualties caused by Disease Non-Battle Injuries (DNBI) upon military campaigns has been a prominent and a continuous feature of military operations.

(1) Armies have had immense problems with heat, cold, and communicable diseases
(2) In all US conflicts, three times as many soldiers have been lost to DNBI as to enemy action
(3) The ultimate objective of a military force, success in battle, demands that troops be maintained in a constant state of good health

There are four major components of the medical threat to field forces

(1) Heat
  (a) Most lethal category of all
  (b) Example: During the 1967 Arab-Israeli conflict, the Israelis enveloped the Egyptians, severing their lines of support, the Egyptians suffered 20,000 deaths due to heat while the Israelis had no deaths and only 128 cases of heat injury
  (c) Demonstrates that health hazards, such as heat, could be as effective as tactical weapons
  (d) Effects of heat can be minimized by ensuring soldiers drink adequate amounts of water
(2) Cold
  (a) Can also be very incapacitating on the battlefield
  (b) Example: In World War II, during the winter of 44-45 in the European theater, over 54,000 US soldiers were admitted

to hospitals with cold injuries. Over 90,000 US soldiers were admitted with cold injuries throughout the war. In the twenty-four days the British were in combat on the Fa kland Islands, they sustained 777 total casualties, 109 (or 14%) were cold injuries. When the British had the Argentineans surrounded at Port Stanley, they could have waited until the Argentineans exhausted their food and water supplies.

(c) Risk of cold injuries can reduce by:
- (i) Incorporating weather data into operations planning
- (ii) Enforcing the proper wearing of the uniform,
- (iii) Frequent changing of wet or damp socks or gloves
- (iv) When the tactical situation permits, providing warming areas

(3) Arthropods that transmit diseases that seriously affect military operations (discussed in LP C191W020)

(4) Diarrheal disease
- (a) Can be contracted from contaminated water or food
- (b) Can have catastrophic impact on a fighting force
- (c) Ensure that soldiers only consume food and water from approved sources
- (d) Waste disposal and handwashing devices are constructed
- (e) Unit dining facilities are operated under sanitary conditions

Increased vulnerability to disease and nonbattle injury because of

(1) Harshness of the environment
- (a) Mosquito-infested jungles
- (b) Sandfly-infested villages
- (c) Hot, dusty deserts
- (d) Cold windy plains

(2) Disruption of the body's natural defenses
- (a) The human body has an excellent capacity to protect itself against disease and climatic injury
- (b) Efficiency of these mechanisms is dependent upon our overall well being, but if the following are disrupted individuals are more suscept ble to illness and combat stress
  - (i) Disruption of circadian rhythms
  - (ii) Adding heat or cold stressors
  - (iii) Feeding meals at irregular hours
  - (iv) Depriving soldiers of sleep

(3) Breakdowns in basic sanitation
- (a) Potable water and proper waste disposal
- (b) Using the latrine or changing your socks becomes a challenge when you are living in a muddy foxhole

The Individual in the Field Environment

In garrison

(1) An individual follows a rather routine course after arising in the morning
(2) Routine acts of personal hygiene are performed in a conveniently located latrine that is warm and has hot and cold water

In the field

(1) Proper sanitation requires coping with the elements of nature, a problem arises; the soldier is suddenly faced with inconveniences
(2) Too cold to change into clean underwear - Even in the summer, a cold-water shower is uncomfortable
(3) The toilet in the field is not as pleasant as the one in garrison
(4) An ordinarily well-groomed individual may become dirty and unkempt
(5) Filth and disease go hand in hand
(6) Dirty, sweaty socks may cause the feet to be more suscept ble to disease
(7) Dirty clothing worn for a prolonged period of time and unwashed hair are open invitations to lice
(8) Reducing DNBI pertain
  (a) To the existing elements of nature
  (b) To the reactions of soldiers brought into the environment
  (c) Inadequate individual PMM in the field is one of the most difficult problems to overcome
  (d) It requires a sense of respons bility on the part of each individual to try to maintain his health regardless of difficulties encountered

The Role of the 91W

Verify medical records for current immunization

NOTE: Immunization involves taking substances related to the biological agent to develop resistance or ant bodies in the body.

(1) Anthrax (on hold)
(2) Plague (if needed)
(3) Hepatitis A
(4) Hepatitis B
(5) Japanese B encephalitis
(6) Rabies
(7) Typhoid
(8) Yellow fever

Gather medical intelligence

(1) Perform a medical threat assessment
(2) Gather information on medical facilities
(3) Assess evacuation assets

(4) Report intelligence findings

NOTE: Medical intelligence gathering is the process for gathering essential medical information BEFORE an operation begins, that will allow unit leaders and medics to tailor operational plans. Medical intelligence should continued to be gathered during an operation, and should be followed by an assessment after an operation has ended.

Perform and maintain field hygiene and sanitation

(1) Promote good personal hygiene
- (a) Arrange for facilities such as handwashing and showering devices, hot water for shaving, and heated dressing area
- (b) Assist in inspecting soldiers to ensure adequate personal hygiene measures

(2) Verify water sanitation
- (a) Drink approved water only
- (b) Prevent water waste
- (c) Protect water sources by good sanitary practices
- (d) Identify water sources
- (e) Treat water source
  - (i) Coagulate and sediment to remove turbidity
  - (ii) Filter to remove remaining turbidity
  - (iii) Disinfect to kill pathogenic organisms
  - (iv) Consider addition of chlorine

NOTE: Calcium hypochlorite is added to the water in amount necessary, with a chlorine demand, to destroy organisms.

NOTE: The sudden disappearance of all chlorine probably indicates recontamination.

  - (v) Consider Lyster bag for disinfecting water

(3) Verify food service sanitation
- (a) Identify factor causing foodborne disease
  - (i) Improper refrigeration
  - (ii) Not maintaining hot foods at product temperature
  - (iii) Not protecting foods from cross-contamination
  - (iv) Improper transportation and storage practices
  - (v) Not protecting foods from contamination
- (b) Store foods
  - (i) Upon receipt, inspect food
  - (ii) Identify if foods need refrigeration or heating
  - (iii) Transport any potentially hazardous foods in insulated food containers
- (c) Consider personal hygiene when handling food
- (d) Clean and sanitize utensils
- (e) Wash, rinse, and properly store utensils
- (f) Follow food preparation guidelines

(i) Potentially hazardous foods should be prepared immediately before serving
(ii) Plan meals to reduce amount of leftovers
(iii) Thoroughly wash and rinse fruits and vegetables

NOTE: Fruits and vegetables grown in areas where human excreta is used as fertilizer must not be consumed raw except with the approval of medical authority.

(g) Inspect food service facilities
(i) Identify basic defects
(ii) Recommend corrective measures

Identify the Hazards

(1) Identify the elements of medical threats
(a) Heat
(i) Recognize conditions
* Increasing temperature
* Increasing humidity
* Direct sunlight
(ii) Identify strategies to protect against heat injury
* Drink plenty of water
* Enforce work-rest cycles
* Stay in shade
* Choose evening or morning for strenuous work
* Avoid tight, nonbreathable clothing
* Maintain physical fitness
* Avoid medications that increase heat injury risk
(b) Cold
(i) Recognize conditions
* Decreasing temperature
* Moisture
* Wind speed
(ii) Identify strategies to protect against cold injury
* Avoid cold, wind, and moisture
* Wear multiple layers of loose-fitting clothing
* Wear a water repellent but "breathable" shell
* Change socks frequently
* Drink plenty of fluids
* Get plenty of rest, and eat all meals
* Avoid alcohol and tobacco
(c) Arthropod-Borne Disease-Identify possible vectors
(i) Tick
(ii) Housefly
(iii) Tse tse fly
(d) Diarrhea (Contaminated Food & Water)

(i) Consider food preparation and handling
(ii) Consider field sanitation
(e) Communicable Diseases in AO
(f) Toxic Industrial Materials
(g) Noise Hazards
(h) Animal & Plant Threats
(i) Combat Stress Concerns - Consider normal symptoms of acute psychological stress
(i) Feelings of fear and anxiety
(ii) Rapid, pounding heartbeat
(iii) Sweaty palms and forehead
(iv) Nausea and vomiting
(v) Rapid, shallow breathing
(vi) Trembling, shaking
(vii) Dilated pupils
(2) Identify operational threats
(a) Sleep Deprivation for Ambulance Drivers
(b) PMCS of medical equipment/vehicles
(c) Regulated/Medical Waste Management

Assess the Hazards

(1) Assess each hazard in relation to probability of a hazardous incident
(a) Frequent (A)
(b) L kely (B)
(c) Occasional (C)
(d) Seldom (D)
(e) Unlikely (E)
(2) Identify the severity of each hazard
(a) Catastrophic (I)
(b) Critical (II)
(c) Marginal (III)
(d) Negligible (IV)
(3) Estimate level of risk for each identified hazard and an estimate of overall risk for operation
(a) **E** - Extremely High Risk
(i) Loss of ability to accomplish the mission
(ii) A frequent or likely probability of catastrophic loss or critical loss
(b) **H** - High Risk
(i) Significant degradation of mission capabilities in terms of required mission standard
(ii) Inability to accomplish all parts of mission
(iii) Inability to complete the mission to standard
(iv) Occasional to seldom probability of catastrophic loss
(v) L kely to occasional probability exists of a critical loss
(vi) Frequent probability of marginal losses

(c) **M** - Moderate Risk
  (i) Expected degraded mission capabilities in terms of required mission standard
  (ii) Reduced mission capability
  (iii) Unlikely probability of catastrophic loss
  (iv) Probability of a critical loss is seldom
  (v) Marginal losses occur with likely or occasional probability
  (vi) Frequent probability of negligible losses
(d) **L -** Low Risk
  (i) Expected losses have little or no impact on accomplishing the mission
  (ii) Probability of critical loss is unl kely
  (iii) Marginal loss is seldom
  (iv) Probability of negligible loss is likely or less

Develop Controls and Make Risk Assessment

(1) Develop controls
  (a) Type of controls
    (i) Educational controls
      * Based on knowledge and skills of units and individuals
      * Implemented through individual and collective training
    (ii) Physical controls
      * May take form of barriers and guards
      * Signs to warn individuals and units
      * Special controller or oversight personnel responsible for locating specific hazards
    (iii) Avoidance
  (b) Criteria for controls
    (i) Suitability - must remove the hazard or mitigate residual risk to acceptable level
    (ii) Feasibility - unit must have capability to implement the control
    (iii) Acceptability
      * Benefit gained by implementing control
      * Must justify the cost in resources and time
      * Assessment of acceptability is largely subjective
(2) Make a risk decision, determine if the risk is justified

Implement Controls

(1) Ensure controls are integrated into SOPs, written and verbal orders, mission briefings, and staff estimated
(2) Ensure controls are converted into clear, simple execution orders understood at all levels

Supervise and evaluate

(1) Supervise
- (a) Spot-checks
- (b) Inspections
- (c) Situation reports
- (d) Brief-backs
- (e) Buddy checks
- (f) Monitor controls to ensure remain effective
- (g) Continually assess variable hazards

(2) Evaluate
- (a) Determine how to ensure successes are continued
- (b) Capture and disseminate lessons learned
- (c) Consider effectiveness of risk assessment in identifying and accurately assessing probability and severity
- (d) Determine whether the level of residual risk of each hazard and overall mission were accurately estimated
- (e) Evaluate effectiveness of each control in reducing or removing risk

Preventive Medicine Measures

(1) Provide guidance in the use of PMM to prevent cold injuries. Hypothermia or frostbite may be prevented by
- (a) Wearing several layers of warm, loosely fitting clothing
- (b) Protecting the face from the wind
- (c) Exercising the face, fingers, and toes to keep them warm

(2) Trench foot, which results from standing in cold water or slush when the temperature is between 32° and 50°F may be prevented by the use of protective footgear and dry socks

(3) Snow blindness, which occurs when the sun shines brightly on unbroken ice or snow, can be prevented by
- (a) Wearing sunglasses or an improvised device made of cardboard or cloth
- (b) Blackening the areas around the eyes

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked Combat Medic Vest System (CMVS) or fully stocked M5 Bag, and personal chemical protective equipment. You are tasked to inspect a company size area of occupation to ensure medical force protection measures are being carried out. Performed appropriate identification of medical force protection issues. Performed appropriate intervention for maintenance and treatment of company area of occupation.

Waste Disposal in the Field

Three categories of waste disposal in the field

(1) Human waste – feces and urine
(2) Liquid waste – liquid kitchen and bath waste
(3) Rubbish – combust ble and non-combustible solids

NOTE: Any of these, when not properly disposed of can become a breeding ground for disease-carrying insects and animals

Human waste disposal

Human waste disposal facilities are a must

(1) Two categories of human waste disposal facilities
  (a) Latrines
  (b) Urinals
(2) Type of facility is dependent on length of time the unit will remain in one place
(3) The longer the stay, the more sophisticated the facility
(4) Other considerations
  (a) Tactical situation
  (b) Weather
  (c) Ground conditions
  (d) Local environmental laws

WARNING: Army units MUST follow all local, state, federal, and international environmental standards during operations. The waste disposal devices described in this lesson MUST be reviewed and authorized by Preventive Medicine personnel prior to their use. This information is presented so units can develop their own waste disposal capabilities in EMERGENCY situations.

Latrines

(1) Unit is responsible for its construction, maintenance, and closure
(2) Decision on the type of latrine to be used is based upon: unit situation and ground conditions
(3) Types of Latrines
  (a) Cat-hole latrine
    (i) Used when the unit is on the move
    (ii) A hole approximately one foot deep and one foot in diameter

(iii) After use, a cat-hole it must be completely filled in and the dirt packed down

(b) Straddle trench latrine
- (i) Unit is remaining in one place for up to three days
- (ii) Trench is dug one foot wide, two and one half feet deep and at least four feet long
- (iii) Multiple trenches should be dug at least two feet apart

(c) Deep pit latrines
- (i) Unit is going on an extended stay, longer than three days
- (ii) Uses a two-seat or four-seat box
- (iii) The two-seat box is four feet long, two and one half feet wide at the base, and eighteen inches high
- (iv) The four-seat box is two feet long
- (v) To minimize flies entering the latrine, pack the dirt tightly around the base of the box
- (vi) Lids that are fly-proof and self-closing should cover the seat holes
- (vii) A metal urine deflector strip is placed inside the front of the box to prevent urine from soaking into the wood
- (viii) The pit for the latrine is dug two feet wide and either three and one half or seven and one half feet long
- (ix) The depth of the pit should equal one foot for each week the latrine will be used, plus one foot for the dirt cover when the latrine is closed

(d) Burnout latrines
- (i) Suited to jungle areas with high water tables, but can also be used when the ground is hard or rocky and digging is difficult or impossible
- (ii) Do not use it in areas in which the air pollution regulations proh bit open fires
- (iii) Be aware that in combat areas, burnout latrines make great targets as the smoke and fire are easily seen
- (vi) When using this type of latrine, urine facilities should also be constructed as it takes extra fuel to burn the liquid
- (v) A burnout latrine is in use one day and being burned out the next, so take this into consideration when planning the number required for your unit

(e) Pail latrines
- (i) Use the pail latrine instead of a deep pit latrine when the environmental conditions make it

imposs ble to dig, in heavily populated areas, or when the tactical situation prohibits burning

(ii) The same seat boxes constructed for a deep pit latrine can be modified for use as a pail latrine by placing hinged doors on the rear of the box, adding a floor and placing a pail under each seat.

(iii) If the pail latrine is located in a building, the box should be placed to form part of an outer wall

(iv) The box should be placed on a floor of impervious material, such as concrete, that slopes toward the rear

(v) The slope allows wash water to drain rapidly

(vi) If possible, line the pails with plastic to reduce the risk of accidental spillage

(vii) Dispose of the contents by burial, burning, or other sanitary measures

(f) Chemical toilets

(i) Usually obtained where environmental laws prohibit the construction of latrines

(ii) Are seen quite frequently these days during training exercises

(iii) Chemical latrines are self-contained, having a holding tank with chemical additives to aid in waste decomposition and to control odor

(iv) Must be cleaned daily, but the contents are emptied based on usage

(4) Planning considerations

(a) Location

(i) Located at least 100 yards downhill from the unit's field food service facility

(ii) 100 feet away from any unit ground water source

(iii) At least 30 yards from the edge of the unit area

(b) Privacy

(i) Place a canvas, brush screen or tent around each latrine

(ii) Should have a drainage ditch dug around its edges to prevent rainwater from flowing into the latrine

NOTE: In cold climates, you may consider heating the enclosure.

(c) Hand-washing devices

(i) Hands contaminated with fecal matter are the most common means of disease transmission

(ii) Hand-washing devices are absolutely necessary

(iii) Simple hand-washing device should be installed outside of each latrine

(iv) Device should be easy to operate and must be kept constantly supplied with soap and water

(d) Cleanliness
- (i) Keep the latrines clean
- (ii) Latrines should be policed daily to ensure they are being properly maintained
- (iii) Clean and sanitize every day to reduce germs and odor

(e) Quantity
- (i) Construct enough latrines to handle the unit population
- (ii) Enough latrines to accommodate four percent of the unit's male soldiers and six percent of the unit's female soldiers at any one time

(f) Closure
- (i) When a latrine pit is filled to within one foot of the top, or when it is to be abandoned, remove the latrine box and spray the contents of the pit, the side walls and the ground within two feet with an approved insecticide
- (ii) Fill the pit to ground level, packing the dirt after every three inches of dirt added
- (iii) Then mound the latrine with twelve inches of soil to prevent flies from entering or exiting the pit
- (iv) Place a sign on the pit that states the type of latrine, the date it was closed, and the unit designation

NOTE: Unit designations should only be included on the closure sign in non-operational areas.

Field Urinals

(1) Proper disposal of urine is as important as the disposal of any other type of waste

(2) Urine disposal devices are always used in conjunction with a urine soakage pit

(3) General guidelines for the urine soakage pit
- (a) Inform soldiers that they should not urinate on the surface of the pit; it defeats the sanitary purpose
- (b) Food service personnel should not use the pit for liquid waste disposal as grease and oils from kitchen waste will clog the pit
- (c) Closed or abandoned pits should be sprayed with a residual insecticide and covered with a two-foot mound of compacted dirt

NOTE: If the latrine is located some distance from the sleeping area, a large can or pail may be placed at a convenient spot to be used as a urinal during the night. In the morning, empty the can into the urine

disposal facility and wash it with soap and water before re-using it.

(4) Urine soakage pit construction
- (a) Four by four foot hole, dug four feet deep then filled with rocks, flattened cans, broken bottles or other similar non-porous rubble
- (b) Ventilation shafts
- (c) Can be inserted in the pit extending from within six inches of the bottom to about seven inches above the surface
- (d) Be sure to top the ventilation shafts with screens to prevent flies from entering the pit

(5) Pipe urinals
- (a) Pipe urinals are simply pipes
- (b) At least one inch in diameter
- (c) Placed at an angle at each corner of the soakage pit
- (d) Additional pipes can be placed on the sides, halfway between the corners to accommodate up to eight soldiers at a time
- (e) Enough pipes should be available to accommodate five percent of the male soldiers in your unit at any given time
- (f) The pipes should extend at least eight inches into the pit and about twenty-eight inches above the surface
- (g) Place a funnel made of tarpaper or sheet metal at the top of each pipe and cover it with a screen

(6) Urine troughs
- (a) Used when the unit is going to be in one area for a long period of time
- (b) When more permanent facilities are desired
- (c) Need to accommodate five percent of the solders at any given time
- (d) Build two feet of trough per soldier
- (e) The trough may be U or V shaped and built of sheet metal or wood
- (f) Wooden troughs should be lined with heavy tarpaper
- (g) The legs on one end of the trough should be slightly shorter
- (h) A pipe is then connected to this end to carry the urine to the urine soakage pit

Liquid waste disposal

NOTE: In the field, liquid waste refers to: Wash, bath, and liquid kitchen waste. Liquid waste from food service operations contains particles of food, grease, and soap.

(1) Liquid waste from food service operations requires treatment before it can be disposed of

(2) Liquid kitchen waste accumulates at the rate of one to five gallons per soldier per day

(3) There are three basic devices used to dispose of liquid waste in the field
  (a) Soakage pit
  (b) Soakage trench
  (c) Evaporation bed
(4) All three devices have one element in common - the grease trap
(5) All liquids from food service operations must have the food, grease, and soap removed to avoid clogging the disposal device

Two main types of grease traps

(1) Baffle grease trap
  (a) The most effective way to remove grease from kitchen waste
  (b) Construction of Baffle Grease Trap
    (i) Constructed from a barrel or a watertight box
    (ii) Inside the barrel or box is a wooden baffle that divides it into two chambers
    (iii) The baffle should run from the top of the barrel or box to within one inch of the bottom of it
    (iv) Above the entrance chamber, insert a strainer into the lid
    (v) The strainer can be made from a small-perforated box filled with straw, hay or burlap
    (vi) On the side of the exit chamber, closest to the pit, insert one end of a pipe about three to six inches below the top of the barrel or box
    (vii) This is the outlet, which will allow the liquid waste to pass into the pit or trench
    (viii) Once the grease trap is in place, the other end of the pipe should be inserted into the center of the pit or trench at least one foot deep
    (ix) When the baffle grease trap is properly positioned and the pipe is inserted into the pit, it is ready for use
(2) Barrel filter grease trap
  (a) Construction of Barrel Filter Grease Trap
    (i) Constructed using a thirty to fifty gallon barrel or drum
    (ii) Remove the top of the drum and bore several holes into the bottom
    (iii) Put eight inches of gravel or small stones in the bottom of the barrel
    (iv) Cover these with twelve to eighteen inches of wood ashes or sand
    (v) Fasten a piece of burlap over the top of the barrel to serve as a course strainer
  (b) The barrel filter grease trap must be positioned in one of two ways for it to be effective
    (i) Place trap directly over the soakage pit or

(ii) Place the barrel on a platform with a trough that leads to the pit

(c) Requires some maintenance to operate efficiently
- (i) Every two days empty and wash the trap
- (ii) Refill it with fresh ashes or sand
- (iii) Wash or replace the burlap strainer daily
- (iv) Burn or bury the ash or sand to prevent infestations from pest or insects

Soakage pits

(a) Four square feet and four feet deep

(b) Bottom of the pit should be covered with non-porous rubble, such as rocks, broken bottles or cans

(c) One soakage pit is adequate for smaller units located in an area for a brief period

(d) Units with 200 or more soldiers it is recommended that you have two soakage pits

(e) To close a soakage pit
- (i) Mound pit over with one foot of compacted soil
- (ii) The compacted soil will keep insects and vermin from entering and exiting the pit
- (iii) Post a sign on the mound that states the type of pit and the date it was closed

Soakage trenches

(a) If digging is difficult due to rocky terrain or the water table is high

(b) The soakage trench can be used to dispose of liquid waste

(c) Construction
- (i) Dig a pit two feet square and one foot deep
- (ii) One-foot wide trenches are then dug, radiating outward from the pit in each direction
- (iii) These trenches vary in depth from one foot at the pit to one and a half feet at the outer edges
- (iv) Line the bottom with the same non-porous material as the soakage pit

Evaporation beds

(a) Used in hot, dry climates where the soil is heavy clay

(b) Heavy clay prevents the use of soakage pits and trenches since it is basically non-absorbent

(c) Built in eight foot by ten-foot rectangles

(d) Three square feet per soldier per day for kitchen waste and two square feet per soldier per day for wash and bath waste

(e) Seldom used, but important to be familiar with their construction

(f) Construction
- (i) Scrape the topsoil from the area and mound it around to form the outside edges of the bed

(ii) Using a spade, turn the dirt over within the bed to a depth of between 10 and fifteen inches
(iii) Using a rake, mound the loosened dirt into a series of horizontal or vertical ridges that are approximately six inches high

Ridges will help to distribute the water evenly within the bed

Garbage and Rubbish Disposal

Garbage

(1) Food waste that occurs during food preparation, cooking and serving
(2) Classified as either dry or wet

Rubbish

(1) Non-food waste that usually comes from kitchens
(2) Classified as either combustible or non-combustible

Garbage and rubbish are disposed of in one of two ways: burial or incineration

(1) Tactical situation will dictate which method is most appropriate
(2) Burial method
  (a) Two techniques used to bury garbage and rubbish: Pit or trench
  (b) Tactical situation will assist you in selecting the most appropriate technique
  (c) Length of the mission is usually the primary factor in deciding whether to use a pit or a trench

NOTE: When using either method, be sure to compact the rubbish before disposing of it. Doing so will help to prevent infestation by insects and rodents.

Burial pits

(1) Preferred for overnight halts
(2) Four feet by four feet and four feet deep
(3) Suitable for one day for one hundred soldiers
(4) Operational considerations
  (i) After depositing rubbish and garbage in the pit, cover it to keep pests away
  (ii) At the end of the day, or when the pit is filled to within one foot of the ground's surface, fill it in with earth
  (iii) Once it is filled in, mound it over with and additional one foot of compacted earth
  (iv) Mark the pit

NOTE: Compacting the earth is very important. Doing so prevents flies and rodents from entering or exiting the pit.

(5) Placement of the pit

(i) Proximity to the foodservice area and the water supply are important
(ii) Minimum of thirty feet and a maximum of thirty yards from the food service area
(iii) At least one hundred yards downstream from any source of water that is in use, for either cooking or drinking

Continuous trenches

(1) For stays of two days or more a continuous trench two feet wide and four feet deep should be used
(2) Overall length of the trench will vary depending upon the length of time the trench will be in use
(3) Operational considerations
  (i) To operate the trench, remove dirt to extend the length of the trench
  (ii) Use the dirt you remove to cover the garbage that has been added during the day
(4) Placement of the trench
  (i) Same considerations for pit placement should be made when locating the continuous trench
  (ii) Locate the trench a minimum of thirty feet and a maximum of thirty yards from the food service area
  (iii) located at least one hundred yards downstream from any source of water that is in use, for either cooking or drinking

Incineration method

(1) Your tactical situation must be taken into account in order to choose the incinerator that is best fitted to the needs of your unit
(2) Located at least 50 yards downwind from camp (the further, the better)
(3) Several types of incinerators

NOTE: Although a significant amount of time is spent discussing incineration and the various types of incinerators, students should be aware that burial is almost always the best method for disposing of garbage and rubbish. Therefore, burial should be used whenever possible.

Rodent Control

Rodent Characteristics

(1) Rodents are a large group of mammals that include a wide variety of animals such as squirrels, chipmunks, prairie dogs, rats, and mice
(2) Two characteristics set rodents apart from other mammals
(3) Two sets of chisel-like incisor teeth
(4) The absence of canine teeth
(5) These are the species we will discuss:
  (a) Norway rat
  (b) Roof rat
  (c) House mouse

Diseases carried by rodents

(1) Rats and mice transmit to humans both through:
  (a) Direct contact
  (b) Contact with their feces and urine
(2) Leptospirosis
  (a) Humans are infected when their broken skin or mucous membranes come in direct contact with the urine or tissue of an infected animal, contaminated water or moist infected soil
  (b) Humans can also contract the disease if they eat food that has been 'marked' with the animal's urine or feces
(3) Salmonellosis
  (a) Spread through urine or feces
  (b) Infections most commonly occur when humans eat food that is contaminated or food that is prepared on a contaminated surface
(4) Hanta virus
  (a) Transmitted through dried rodent urine and feces
  (b) Infection occurs when the dried fecal and urine particles are inhaled
(5) Rat bite fever: Caused by the bite of the rat

Rodent management

(1) Rodents can be a problem in any area where soldiers live
  (a) Where there is food, water, and shelter there is the possibility of rodent infestation
  (b) The earlier a rodent problem is detected, the easier it is to control or eliminate
(2) Rodent survey
  (a) Must be ongoing to be effective
  (b) Looks for signs of rodents such as live rodents, dead rodents, droppings and smudge marks, rodent tracks and trails, gnaw marks, burrows, and rodent sounds and odors
(3) Eliminating food sources
(4) Eliminate access to garbage by using tight-fitting lids and disposing of garbage regularly in approved sites
(5) Store all food in a tightly covered, metal, rodent-proof container
(6) Clean up any food spills that may occur
(7) Eliminating water sources
  (a) L ke the food sources, anytime you can reduce the rodents' access to a water supply you will greatly reduce the likelihood that they will stay in the area.
  (b) Drain run-off puddles
  (c) Remove any items that may hold water, such as old tires and cans
  (d) Keep stored water in bottles or five-gallon cans that close tightly
  (e) Store cases of bottled water off the ground on pallets

(f) In areas with indoor plumbing, check to ensure that there are no leaky pipes. Repair any leaks found as soon as possible.

(8) Eliminating shelter
- (a) Rodents rely on concealment when traveling, feeding, and resting.
- (b) Keep the unit area free of unnecessary debris, building material, and trash
- (c) Minimize the amount of vegetation around buildings
- (d) Keep living areas free from clutter

Safety measures to protect yourself from the parasites that may still be living on the dead rodent

(1) Do not assume that because the rodent is dead that all the parasites have left its body

(2) Spread insect repellent on your hands, sleeves, and the front of your uniform (This will help to protect you from any remaining parasites)

(3) Use long-handled tongs or a shovel to pick up the dead animal

(4) Place the carcass in a plastic bag or in a metal container with a tight-fitting lid

(4) Burn or bury the remains IAW your unit's tactical situation and local environmental restrictions

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked Combat Medic Vest System (CMVS) or fully stocked M5 Bag, and personal chemical protective equipment. You are tasked to inspect a company size area of occupation to ensure medical force protection measures are being carried out. Performed appropriate identification of medical force protection issues. Performed appropriate intervention for maintenance and treatment of company area of occupation.

Arthropods important to military operations

Mosquitoes

(1) The most important arthropod for a number of reasons
- (a) Can find them practically everywhere
- (b) Found in usually in high numbers
- (c) Capable of transmitting a large number of diseases
  - (i) Some of which are war-stoppers
  - (ii) During WWII, Korea, and Viet Nam entire units were rendered combat ineffective by malaria

(2) Life cycle
- (a) Live short lives – about one month
- (b) Four life stages

(3) Habitat
- (a) Mosquito larvae inhabit areas with standing water such as ponds, puddles, and ditches
- (b) Anything that can hold water provides a habitat for mosquito larvae
- (c) Things like discarded cans, tires, and tree holes
- (d) Adult mosquitoes continue to inhabit their larval habitats without venturing too far away

Filth flies

(1) Filth fly transmits many diseases
- (a) There have been situations in which filth flies have been allowed to breed unhampered
- (b) Resulting fly-borne disease outbreaks made hundreds of soldiers sick within a few days

(2) Life cycle
- (a) Live short lives – usually about six weeks
- (b) Four life stages
- (c) Filth flies mature in about two weeks, then live as adults for an additional three or four

(3) Habitat
- (a) Live in or near animal or human waste, garbage, decomposing plants and animals, or in mud with high organic content
- (b) A large population of flies is usually a good indicator of unsanitary conditions

Fleas

(1) Adult fleas are not only persistent and painful biters, but are efficient vectors of a number of diseases

(2) Life cycle
  (a) Four life stages
  (b) The flea matures in about one month and the adult flea can live for as long as one year
(3) Habitat
  (a) Often associated with animals, although many humans are carriers
  (b) Large populations of fleas can usually be found around animal beds, burrows, and nests

Lice

(1) Head and body lice are considered external parasites of man
  (a) They live outside the human body and obtain nutrients from it
  (b) Both species bite causing an itching inflammation of the skin
  (c) Only the body louse is a disease vector
(2) Life cycle
  (a) Life cycle has only three stages
  (b) Matures from egg to adult in about sixteen days
  (c) Will live as an adult for another nine days, or so
(3) Habitat
  (a) Normally inhabit the hairy parts of the body, along with clothing
  (b) Often prevalent in crowded or unsanitary conditions
  (c) Soldiers who do not practice good personal hygiene can become infested with lice and pass them on to other soldiers when they come in contact with their hair, clothing, sleeping bags, or other linens

Cockroaches

(1) Cockroaches can carry a variety of disease-causing pathogens
(2) Life cycle
  (a) Life cycle has only three stages
  (b) They mature in about three months and live for adults for up to two hundred days
(3) Habitat
  (a) Cockroaches prefer habitats with three criteria:
    (i) Water
    (ii) Shelter- such as cracks or crevices
    (iii) Food, such as garbage or spillage
  (b) Anytime these three conditions exist, you should look for the existence of cockroaches
  (c) These three criteria usually exist together in kitchens and bath areas, especially when conditions are less than sanitary

Ticks and mites

(1) These two arthropods are very similar in biology, so are considered together

(a) Ticks are the most efficient arthropod when it comes to disease transmission
(b) This is because the female tick can pass the pathogen to the egg so that when the larva hatches it is already able to pass on the disease upon eating its first meal

(2) Life cycle
(a) Four life stages
(b) They live as adults for anywhere from one month to two years

(3) Habitat
(a) Ticks and mites are generally found in areas of tall grass or underbrush in close proximity to mammal resting places and watering holes

Arthropods affect on human health

Direct injury - Results when the arthropod, itself, causes the disease or discomfort

(1) Bites
(a) Most obvious mechanism for direct injury
(b) Annoying, painful, and can decrease a soldier's productivity level
(c) In northern latitudes bite counts of pests can reach twenty bites per minute

(2) Envenomization
(a) Direct injection of venom into the body through a bite or sting
(b) The damaging results of a bite or sting can range from
(c) Dermatitis, or inflammation of the skin (as seen with flea bites)
(d) To actual tissue damage (the result of the bit of the brown recluse spider)

(3) Entomophobia - This condition is the irrational fear of real or imaginary insects

NOTE: While this condition is not usually prevalent among soldiers, it can occur so it needs to be mentioned.

Direct Injury - Accidental Injury to Sensory Organs

(1) Insects can cause accidental injury to our sensory organs
(2) Any insect that enters the ear, nose, or eye can cause severe irritation
(3) Myiasis
(a) A condition in which fly larvae invade a human host
(b) Occurs in one of two ways:
(i) A fly lays its eggs on an open wound, when the eggs hatch the larvae begin to feed on human tissue
(ii) A person may eat fly larvae on contaminated food. However, when this happens, the food is usually passed through the digestive tract

without damage or illness. The process of myiasis may also be used as a medical treatment. In such cases, fly larvae are intentionally placed on wounds. The larvae feed on the dead tissue, which in turn promotes the growth of living tissue.

(4) Allergies
- (a) Potent allergens
  - (i) Cockroach feces and the skins they shed when molting
  - (ii) Dust mites that are found in many buildings and in bedding materials such as mattresses and pillows
  - (iii) Allergies to the venom of some biting and stinging arthropods are also prevalent
  - (iv) While not often considered deadly, the nuisance caused by allergic reactions can, itself, be enough to reduce a soldier's productivity and effectiveness

Spread of disease

Passive transmission (also called Mechanical Transmission)

(1) This method of transmission occurs when the arthropod carries the pathogen from one host to another

(2) During this transmission, the pathogen does nothing during the transfer except 'go along for the ride'
- (a) Filth flies carry bacteria or other disease-causing organisms on their mouthparts and feet from infected human feces. If soldiers eat food that has been contaminated by a fly landing on it and depositing these pathogens, dysentery or other diarrheal disease may occur.
- (b) Cockroaches provide a similar 'taxi service' by carrying disease organisms on their legs, feet, and mouthparts. These pathogens can cause diarrheal diseases such as cholera.

Active transmission (also called biological transmission)

(1) In this method of transmission the disease-causing agent undergoes some change in the body of the arthropod

(2) The pathogen may multiply or simply develop into an infectious form

(3) There are several ways a pathogen can be passed to humans via active transmission
- (a) Inoculation
  - (i) A vector injects the pathogen into the host with its saliva while it feeds on the host
  - (ii) Mosquitoes transmit malaria by inoculation.
- (b) Regurgitation
  - (i) The vector vomits the pathogen into the host while it feeds on the host

(ii) Fleas transmit bubonic plague by regurgitation

NOTE: The bacteria that causes bubonic plague multiplies rapidly in the flea's gut and blocks it like stopping up a drain. When the flea attempts to eat, it can not ingest the host's blood due to the blockage. The flea ends up regurgitating the bacteria into the host.

(c) Fecal contamination
- (i) The vector defecates into a wound on the host
- (ii) As the wound itches, scratching and rubbing by the host causes the pathogen to enter the host's body
- (iii) Chagas' disease, also known as North American Sleeping Sickness, is transmitted in this way by the kissing bug

NOTE: The kissing bug bites the host causing a wound. It then takes a few steps forward and defecates into the wound.

(d) Crushing the vector
- (i) The vector is smashed onto the skin of the host
- (ii) When the host wipes off the dead bug, the pathogen is rubbed into the skin
- (iii) The body louse transmits epidemic typhus in this manner

NOTE: The bacteria that cause epidemic typhus live and multiply in the body of the body louse.

Arthropod-borne diseases and their vectors

Several arthropod-borne illnesses that are significant to military operations

(1) Malaria
- (a) Most important disease to the military
- (b) The Anopheles mosquito transmits this disease
- (c) Malaria is responsible for the death of over three million people each year

(2) Yellow fever
- (a) The Aedes mosquito transmits this viral disease
- (b) No longer considered a real threat to soldiers in the army since soldiers are now inoculated against this disease

(3) Dengue fever
- (a) The Aedes mosquito transmits this disease
- (b) It is most prevalent in the tropical and sub-tropical areas of Asia, Africa, and Central and South America
- (c) No vaccine has been developed for this disease

NOTE: This disease is characterized by fever, headache, extreme pain in the joints and muscles, and a rash.

(4) Encephalitis
- (a) The Aedes and Culex mosquitoes carry several forms of this disease
  - (i) St. Louis encephalitis
  - (ii) Japanese B encephalitis
  - (iii) California encephalitis
- (b) Ticks carry another form of this disease known as Russian spring/summer encephalitis

NOTE: Symptoms of this disease may include headache, fever, and extreme drowsiness. The disease may leave lasting effects such as deafness, epilepsy, or an altered mental capacity, known as dementia.

Diseases and Their Vectors – Others

(1) Sand fly fever
- (a) Also known as phlebotomus fever
- (b) This viral disease is carried by the phlebotomine sand fly

(2) Leishmaniasis
- (a) The sand fly transmits this disease
- (b) Transmitted to humans by the transfer of a single-celled animal known as a protozoa

(3) Epidemic typhus
- (a) The body louse is the vector for this disease
- (b) Has occurred in widespread epidemics during wartime or other periods when sanitation has not been strictly observed
- (c) Occurs in primarily temperate areas
- (d) During WWI, one hundred fifty thousand soldiers died of this disease

(4) Bubonic plague
- (a) Any one of the arthropods that are parasitic on rodents may transmit this disease
- (b) Most important of these is the rat flea
- (c) During the Middle Ages, bubonic plague occurred in huge outbreaks known as pandemics
- (d) These pandemics were known to wipe out the entire population of many cities

Pesticide

Sanitation practices

(1) The best way to control bugs is to first follow proper sanitation practices, then augment with chemicals

(2) Improper sanitation practices: Consider a pile of opened garbage. You can spray and spray, but unless you eliminate this breeding ground for flies, you're still going to have a problem

(3) Eliminate arthropod habitats
- (a) The safest way to control most arthropods is to eliminate their living and breeding areas
- (b) Control rodents in the unit area
- (c) Use proper waste disposal procedures

(d) Avoid animal nesting areas

Chemical practices

(1) Even the best sanitation efforts fall short of controlling arthropods, when this is the case, augment efforts with the use of pesticides. (AUGMENT is the operative word here – chemicals are not meant to take the place of the individual or unit-level preventive medicine measures)

(2) Properties of pesticides

(a) Pesticides are toxic, or poisonous, substances designed to kill pests such as mosquitoes, ticks, and rodents

(b) Pesticides and solvents

(i) The toxic ingredients in pesticides are often mixed with solvents such as kerosene or fuel oil

(ii) The presence of these solvents makes them more hazardous to humans.

(c) Pesticide absorption into the skin

(i) The toxic chemicals in pesticides are often mixed with an oil-based solution

(ii) Human skin repels water but absorbs oil. Therefore, the pesticide is absorbed into the skin along with the oil.

(iii) protective clothing is required when working with pesticides

WARNING: Because of their toxic properties, all pesticides should be considered potentially hazardous. You can find the hazard and risk information on the pesticide label. Always refer to the label instructions for use, protective clothing requirements, and safety precautions prior to using a pesticide. In all cases, THE LABEL IS THE LAW.

(3) Estimating the hazard potential for any pesticide is important prior to using it

(a) Several factors to consider when determining the hazards associated with chemical use

(b) Determine the hazard posed by a particular chemical by asking yourself these questions:

(i) What are the toxic effects if the pesticide is accidentally inhaled or ingested?

(ii) What is the concentration of the toxic substance I will be handling while mixing the pesticide? While applying it?

(iii) How much pesticide needs to be applied in order to achieve the desired results?

(iv) How often do I need to apply the pesticide?

(v) What environmental conditions exist at the time of application?

(vi) Am I indoors or outdoors? Is there proper ventilation?

(vii) Is there a breeze?
(viii) What temperature is best and safest for the application of this chemical?

NOTE: It is important to remember that the hazard for any pesticide is neglig ble, as long as you use it correctly.

Safety precautions

(1) Consult the label instructions for additional safety precautions that are unique to the chemical that you plan to use
(2) Pesticides should not be stored or used near an open flame.
(3) Do not mix pesticides. Mixing pesticides can render them ineffective or, worse, can create an even more toxic substance.
(4) Dispose of any unused pesticide properly
5) When a pesticide can not be used for its intended purpose or when a pesticide is no longer authorized for use, any unused quantity should be returned to the manufacturer through the Defense Marketing and Utilization Office (DRMO)
(6) Dispose of the empty pesticide container properly
(a) Triple-rinse the container to ensure that the container is free of chemicals prior to disposal
(i) First, fill the pesticide container with water
(ii) Pour the rinse water into the 2-gallon sprayer along with the water used to dilute the pesticide being applied.
(iii) Repeat steps 1 and 2 two more times
(b) Then crush or puncture the container prior to disposal to render the container unusable

TERMINAL LEARNING OBJECTIVE

Given a combat stress casualty who is displaying potentially violent behaviors and might harm his/herself or others. Using patient restraint set (Contained in the Medical Equipment Set) or improvised patient restraint techniques (Sandwiching a patient between two litters) restrain the patient without causing harm to the patient or health care providers.

Agitated and violent patients

Agitated and Violent Patients: Differential Diagnosis

NOTE: Definition of Agitated-(often from other medical providers)- upset, anxious, loud, uncooperative, threatening, aggressive, assaultive and/or violent

(1) When first called to evaluate an agitated patient, one might be inclined to begin immediately to control the patient with medication or by physical restraint. This may be necessary if the patient is dangerous to him/herself or others at that time

(2) If you are not pressed to immediately intervene, it is often better to allow some time for observation, physical examination and mental status examination

(3) You will also want to review any medical records available

There are many etiologies for agitation.

A well thought out differential diagnosis will allow you to select treatments resulting in the highest chances for success

There are three general areas within the differential diagnosis: Organic, Psychiatric and Character (or Personality).

Ask yourself, "Is this agitation due to an organic, psychiatric or personality problem?"

(1) Organic Etiologies - Organic refers to a condition caused by a known medical condition

(a) Signs and symptoms suggestive of an organic cause of agitation include:

(i) Serious medical illness with propensity to effect brain function, particularly the elderly

(ii) Use of medications with propensity to effect brain function, particularly the elderly

(iii) History of substance abuse

(iv) Sudden onset

(v) No previous history of such episodes

(vi) Disorientation

(vii) Variable attention and alertness

(viii) Poor memory for immediate / recent events

(ix) Uncommon hallucinations (visual) Insight about hallucinations or delusions (I know this doesn't make sense)

(b) Differential Diagnosis for Organic cause to Agitation Mnemonic:

(i) Infectious, HIV, Meningitis, Syphilis, Encephalitis
(ii) Withdrawal Alcohol, Benzodiazepines, Opioids
(iii) Acute Metabolic Liver / Renal failure, Ca++ Na+ disturbance, Porphyria
(iv) Trauma: Head Injury, Heat Stroke, Burns, Postoperative States
(v) CNS Disease Stroke, Tumor, Hemorrhage, Multiple Sclerosis, Seizure, Dementia-Alzheimer's, Multi-Infarct, Normal pressure hydrocephalus, Hypothyroid. Parkinson's Disease, Wilson's Disease. Hypoxia Anemia, Cardiac / Pulmonary Failure, Carbon Monoxide. Deficiencies B12, Folate, Thiamine, Niacin
(vi) Endocrinopathies Hyper and hypoadrenalism, Hypo and hyperthyroidism, Hyper and hypoglycemia, hyper and hypoparathyroidism
(vii) Acute Vascular Hypertensive Encephalopathy, Vasculitis, Shock
(viii) Toxins Medications, Solvents, Pesticides. Heavy Metals Arsenic, Lead, Manganese, Mercury, Thallium. Substance Abuse Cocaine, Amphetamine, PCP, LSD, Inhalants

(2) Psychiatric Etiologies- (The organic etiologies described above would include conditions that would be described as Delirium, Dementia and Organic Mental Syndromes). Traditional psychiatric illnesses must also be considered when evaluating patients for agitation

(a) Signs and symptoms suggestive of psychiatric causes of agitation:

(i) History of psychiatric illness
(ii) History of previous episodes of agitation related to decompensation due to psychiatric illness
(iii) History of poor compliance with psychiatric treatment
(iv) Traditional psychotic symptoms due to psychiatric illness, e.g. auditory hallucinations, paranoid delusions, poor insight into psychotic symptoms

(b) Differential Diagnosis for Psychiatric causes of agitation:

(i) Schizophrenia-particularly agitated catatonia, paranoid and disorganized types
(ii) Schizoaffective Disorder Brief Reactive Psychosis Bipolar Affective Disorder-manic and mixed Adult Autism, Acute Stress Disorder Post Traumatic Stress Disorder Dissociative Identity

Disorder Intermittent Explosive Disorder
Adjustment D/O with mixed emotional features

(3) Personality Etiologies - Patients with certain personality styles tend to become agitated when under emotional stress. These tend to be the more "primitive" of the personality disorders.
  (a) Differential Diagnosis for Personality causes of agitation: Antisocial, Borderline, Narcissistic, Histrionic, Paranoid

Treatment options for the agitated patient

Treatment Options for the Agitated Patient:

(1) Specific treatments for agitated patients depend on the underlying etiology
(2) Treatment of the underlying medical condition causing the agitation is key in delirium/organic mental syndrome
(3) Medication may be needed for the agitation
(4) Thoughtful bedside manner and a non-stimulating environment will also be helpful
(5) Dim lights are helpful
(6) Maintain orientation as much as possible with unit, mission, position and contact with member's of his company
(7) In primary psychiatric conditions, anti-psychotic and/or anti-anxiety medication is most effective individually
(8) Again, a non-stimulating environment is helpful
(9) Basic supportive psychotherapy and, if indicated, psychoeducation may reduce agitation

Personality disorders require a combination of supportive and basic cognitive psychotherapies and firm limit setting

(1) Law enforcement involvement may be necessary if the patient will not comply with your interventions
(2) Medication is much less likely to be indicated, and may be contra-indicated because of suicidal or substance abuse history

Maintaining a low profile

Do not challenge the patient as this will most likely enrage the patient further.

(1) Tell the patient who and what you are
(2) Speak clearly
(3) Avoid prolonged eye contact
(4) Maintain a medium distance from the patient
(5) Empathize with the patient if they are clearly upset over a certain issue

Your interview may be brief due to the agitation. Get as much information as possible, as quickly as possible.

(1) Open ended questions may be an inefficient method for information gathering here
(2) Build trust with the patient
(3) In the appropriate setting offering food or beverage may quickly turn a belligerent patient into a cooperative one

(4) When possible give the patient choices in the course of their evaluation and treatment. This will give them a greater sense of control.
(5) Maintain a sense of time
(6) If the patient is cooperative enough to allow for a blood draw, make sure that a PA/MD order all the tests you think you may want on this one blood draw
(7) You must also keep in mind that with Urine Drug Screens, it may be now or never

Prediction of Violence

Prediction of Violence:

(1) Mental health professionals are often asked to predict violence
(2) This is a very difficult task because an episode of violence is a relatively rare event
(3) There are no clear and definite predictors for who will and who will not be violent
(4) Any evaluation that asks for a prediction of violence should comment on the low reliability of mental health professionals predicting violence
(5) Your task is simply to comment on the risk factors for potential violence, and to take protective action when the risk factors are numerous and/or severe

General Risk Factors for Violent Behavior:

(1) In general, patients with a serious psychiatric disorder (Axis I) are three times as likely as the general population to commit an act of violence
(2) Nevertheless, the overwhelming majority of violent acts are committed by individuals who:
    (a) Do not have a major psychiotic diagnosis. A past history of violence or impulsivity, Alcohol and Drug use
    (b) Organic Mental Disorders-Organic Personality, Delirium, Paranoid delusions Psychosis-particularly Schizophrenia, Bipolar Affective D/O in manic state
    (c) Antisocial Personality, Borderline Personality Demographics-young, male, live in poverty, live in environment of decreased social control (live in environment where violence is part of everyday life)
    (d) Weapons- knowledge, skill and access
    (e) Other means available to inflict injury
    (f) Recent humiliating life event
    (g) Recent sense of being unfairly treated
(3) Predictors of Impending Violent Behavior:
    (a) Brooding over an event where individual was unfairly treated
    (b) Recent threats to act out violently
    (c) Evidence of making plans to act out violently
    (d) Threatening and/or loud speech

(e) Hypervigilance
(f) Staring

(4) Signs of agitation:
(a) Tremors
(b) Sweating
(c) Pacing
(d) Clenching of fists, teeth and hands

Personal Safety and Take Down Interventions

It may become necessary to physically restrain an agitated person.

The following represent options that may be taken and the order that they may be taken in to handle agitated casualties:

(1) Level I Non-violent Interventions:
(a) Separate patient from other people if possible
(b) Remove any type of weapons or objects which could serve as weapons
(c) Make sure that you have a way out of the room if the situation escalates
(d) Present a calm, supportive appearance
(e) Speak clearly
(f) Show respect, remain nonjudgmental
(g) Avoid staring and give some distance
(h) Ask why they are upset and what could be done about it. (How can we help you?)

(2) Level II If Violence Appears Imminent:
(a) If verbal interventions fail then you need to move to a higher level of intervention called the Show of Force
(b) A "Take Down" Team is composed of 5 people as a minimum, one person to control the head and one person for each extremity
(c) Designate one person as the leader and four followers
(d) To begin, gather around the leader with an image of confidence
(e) The leader states "come calmly or you will go in restraints"
(f) The leader states the reason why restraints are needed
(g) Give the patient a few seconds to back down

(3) Level III The Take Down:
(a) At the signal of the leader, each team member controls his/her designated extremity and one staff member holds the head
(b) The patient is brought to the ground/floor in a backward motion and then rolled over on his/her abdomen
(c) Restraints are then applied and the patient is brought to an appropriate area
(d) After the take-down is over and the patient is safely admitted, the team and other staff should discuss the events leading to a take down and the take down itself

(e) After several hours or whenever the patient is calm and cooperative, the admitting staff member who ordered the take down should discuss it with the staff

Restraints

Restraints used to subdue a patient may vary from one unit to the next.

It is important that all personnel be familiar with their specific use and application.

It is also noteworthy that each soldier medic should be familiar with their unit SOP's regarding the use and application of restraints

Restraint devices that the soldier medic will most likely see and employ

(1) Leather restraint system
Included in the Medical Equipment Set
This set includes 2 adjustable wrist and 2 adjustable ankle cuffs and an adjustable and lockable securing strap for each cuff

(2) Improvised litter restraint method
This is an improvised method of restraining a patient in which two litters are employed
The patient is secured between two litters using patient securing straps

CAUTION: Since restraints can cause bodily harm and in extreme cases death, it is critical that they be used only as a last resort and only by qualified personnel

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked Combat Medic Vest System (CMVS) or fully stocked M5 Bag, IV administration equipment and fluids, selected medication, restraints and documentation forms. Given the equipment and supplies at Echelon 2 and below. You encounter a casualty who displays symptoms of battle fatigue to include hyperalertness, anxiety, disordered thinking, and inability to carry on a coherent conversation. The casualty may or may not demonstrate violence directed at others or self. No other injury (ies) is/are identified. Triage the battle fatigue casualty and perform basic intervention using battle fatigue treatment principles.

Combat stress

Definition of Stress

(1) Stress is the body's and mind's process for dealing with uncertain change and danger
(2) Elimination of stress is both impossible and undesirable
(3) Stress can have positive and negative effects on functioning

NOTE: The positive effects of stress can enhance performance whereas the negative effects of stress can impair overall functioning.

(4) Excessive stress may lead to dysfunctional combat behaviors
(5) Controlling stress is key to controlling these resultant behaviors

Types of Combat Stress

(1) Physical (environmental and physiological)
  (a) Examples of environmental stressors
    (i) Heat, cold, or wetness
    (ii) Difficult terrain
    (iii) Hypoxia, fumes, poisons, chemicals
    (iv) Ionizing radiation
    (v) Physical work
    (vi) Noise, vibration
    (vii) Visibility
    (viii) Infectious agents/disease
  (b) Examples of physiological stressors
    (i) Sleep debt
    (ii) Dehydration
    (iii) Poor hygiene
    (iv) Physical fatigue
    (v) Illness and injury
    (vi) Malnutrition
(2) Mental (cognitive and emotional)
  (a) Examples of cognitive stressors
    (i) Too much or too little information
    (ii) Sensory overload versus deprivation
    (iii) Ambiguity, uncertainty, isolation
    (iv) Time pressure versus waiting

(v) Unpredictability
(vi) Rules of engagement
(vii) Organizational dynamics
(viii) Hard choices versus no choices

(b) Examples of emotional stressors
(i) Threats to safety
(ii) Loss, bereavement
(iii) Anger, resentment, frustration
(iv) Boredom, inactivity
(v) Home front worries
(vi) Loss of faith
(vii) Interpersonal conflict

Combat stress behaviors

Adaptive behaviors

(1) Unit cohesion
(2) Sense of eliteness
(3) Alertness and vigilance
(4) Increased strength and endurance
(5) Tolerance for hardship, pain, discomfort
(6) Heroic acts and self-sacrifice

Dysfunctional behaviors

(1) Misconduct stress behaviors
(a) Mutilating dead
(b) Killing enemy prisoners and noncombatants
(c) Torture, brutality
(d) Recklessness
(e) Alcohol and drug abuse
(f) Looting and rape
(g) "Fragging"
(h) Desertion
(i) Abuse of sick call

(2) Battle Fatigue
(a) Hyperalertness
(b) Fear, anxiety
(c) Anger, rage
(d) Somatic complaints
(e) Depression, indecision
(f) Exhaustion, apathy
(g) Poorer performance

Triage

DUTY category

(1) Used for soldiers who show mild battle fatigue and are expected to quickly recover
(2) The soldier must be capable of self-care and have the ability to respond if the unit comes under attack
(3) Recovery may include:
  (a) Food and nourishment
  (b) Fluid to drink
  (c) A quiet place to nap
  (d) Reassurance to the soldier
  (e) The opportunity to ta k about experience

REST category

(1) Used for soldiers having moderate to severe BF symptoms, or having no treatment response
(2) Requires 1-2 days of duty in the soldier's own battalion/ battery HHC

NOTE: These soldiers may be held in the BSA under the control of the FSMC or Brigade Adjutant.

(3) Monitored by the brigade CSC team (directly or supervisor's reports).
(4) If symptoms persist or worsen, category is elevated to HOLD.

HOLD category

(1) Used for soldiers who require medical observation and restoration treatment at the FSMC's patient holding area
(2) Treatment is provided for 1 day (or up to 3 days if return to duty is anticipated)
(3) Soldiers must be told that they are not patients

REFER category

(1) Used for BF and NP cases which cannot be safely held or treated in the FSMC and require evacuation to a higher echelon of care
(2) These cases may be initially triaged into this category, or may have demonstrated no treatment response
(3) Any REFER cases with good potential for RTD within 72 hours are held for treatment in the MSMC patient holding section
(4) Evacuation should only occur in nonmedical vehicles when safely possible
(5) Physical and/or medication restraints are used when necessary

Principles of combat psychiatry

Maximize combat stress prevention

(1) Primary prevention - decreases the occurrence of dysfunctional combat stress behaviors through control of known contr buting stressors
  (a) First time in combat
  (b) Home front worries
  (c) Intense battle with many KIA/WIA
  (d) Insufficient tough/realistic training
  (e) Poor unit cohesion
  (f) Sleep/food deprivation
  (g) Inadequate information or no clear sense of purpose

(2) Secondary prevention - minimizes dysfunctional combat stress behaviors when they first occur. Do this by training and assisting unit leaders, chaplains, and medical personnel to:
  (a) Identify warning signs and symptoms.
  (b) Intervene immediately.
  (c) Prevent spread of dysfunctional behavior through segregation and treatment.
  (d) Reintegrate recovered battle fatigue soldiers into their units.
  (e) Taking appropriate disciplinary action for criminal conduct.

(3) Tertiary prevention - minimizes long term dysfunctional combat stress behaviors and post-traumatic stress disorders. Do this by assisting unit leaders, chaplains, and medical personnel in:
  (a) Critical event debriefings
  (b) End of tour debriefings
  (c) Continued monitoring for delayed Posttraumatic Stress Disorder (PTSD) symptoms

Treat battle fatigue

(1) Proximity - treat a soldier as close to their unit and battle as possible
(2) Immediacy - treat as soon as possible
(3) Expectancy - give the soldier expectations for full recovery and RTD
(4) Simplicity - Use brief, straightforward methods to restore physical well-being and self-confidence

Defer psychiatric diagnosis

(1) Triage emergency medical/surgical conditions and then treat
(2) Treat others for battle fatigue using the PIES plan
  (a) Proximity - treat soldiers as close as possible to their units and battle
  (b) Immediacy - identify need for care early and treat immediately
  (c) Expectancy - provide positive outlook to combat fatigue casualty. Casualty should expect full recovery and early

return to duty (RTD). The most important principle in treatment.

(d) Simplicity - use simple, brief straightforward methods to restore physical well being and self confidence using non-medical terminology and techniques

(3) Non-responders should be evacuated to a higher level of care. Final diagnosis is determined at this level.

Other battle fatigue treatment principles

Initial Assessment

(1) Brief medical and mental status examination.
(2) Must differentiate between battle fatigue and more emergent illnesses.
(3) Treat battle fatigue while covertly observing for other serious conditions.

Reassure

(1) Tell the soldier that he has battle fatigue and that it is a temporary condition.
(2) Explain that battle fatigue is a normal reaction to severe conditions.
(3) Give expectations that he/she will return to duty after a short period of rest.
(4) Keep the soldier active.

Separate

(1) Keep battle fatigue soldiers separated from patients with serious medical surgical and psychiatric illnesses.

NOTE: Association with severely ill will worsen BF soldier's symptoms (called *contagion*).

(2) Convalescent soldiers and battle fatigue soldiers may be treated together after the contagious stage is over and return to duty is imminent.

Simple Treatment

(1) Keep treatment as simple as possible using the PIES treatment plan.
(2) Provide relief from danger but maintain a tactical atmosphere, which is not too comfortable.

Restore Confidence

(1) Keep soldiers active through structured military work details, physical exercise, and recreation.
(2) Get soldiers to ta k about their experiences that led to battle fatigue.
(3) Provide a supportive environment for self expression.
(4) Reinforce the soldier's identity as a soldier, not as a patient.

Avoid Sedatives and Tranquilizers

(1) The battle fatigue soldier needs to maintain a normal state of alertness, coordination and understanding.
(2) Sedating medications may be used if sleeplessness or agitation cannot be otherwise managed.

NOTE: Remember that the soldier will think that medications are used by patients.

Evacuation and Hospitalization

(1) Evacuate and hospitalize BF soldiers only when absolutely necessary.
(2) Evacuation and hospitalization may significantly worsen initial symptoms and delay recovery.
(3) Evacuate by general-purpose vehicles not ambulances.

Unresponsive and Unmanageable Cases

(1) A soldier whose battle fatigue or neuropsychiatric symptoms do not improve or make him too disruptive to manage may be evacuated to the next echelon of care.
(2) Prior to evacuation, give the soldier a clear expectation that he will improve.

NOTE: Be careful not to let these cases become an escape route from combat.

Hospitalization

(1) Use when the battle fatigue soldier's safety is uncertain.
(2) Non-hospital environments are preferable to hospitalization.
(3) If a soldier is inappropriately hospitalized, inform him that he only has battle fatigue and that he will be returned to a forward area for treatment.

TERMINAL LEARNING OBJECTIVE

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Degrees of Battle Fatigue

(1) Mild
- (a) Soldier communicates feelings of fear/anxiety in battlefield environment but there are no signs of anxiety present
- (b) This level does not require removing soldier from combat

(2) Moderate
- (a) Soldier displays tears, gross trembling, or difficulty in concentrating
- (b) This level may/may not require evacuation of soldier. The evacuation decision is based on mission, the soldier's effectiveness and the severity of presenting symptoms

(3) Severe
- (a) Soldier can no longer relate to his environment and can suffer from hysterical blindness and paralysis
- (b) Requires immediate evacuation. Symptoms are too disruptive to unit's mission to remain or soldier needs observation to rule out medical or surgical condition

WARNING: Any soldier has the potential to become a battle fatigue casualty.

Battle Fatigue Reactions, Symptoms and Treatment

Battle Fatigue reactions and Symptoms

(1) Manageable reactions-"combat stress"
- (a) Muscular tension--headaches, inability to relax, cramps
- (b) Shaking and tremors
  - (i) Mild shaking--may appear when undergoing shelling or bombing. Appears and disappears rapidly and is a normal reaction to dangerous conditions.
  - (ii) Marked or violent shaking, sometimes incapacitating; may also persist after the cause has ceased.
- (c) Perspiration--it is normal to experience either mild or heavy sweating or chills under combat stress

(d) Digestive and urinary system reactions
  (i) Nausea and vomiting which may occur during or immediately after a fire fight, shelling or intensive battle conditions
  (ii) Loss of appetite
  (iii) Acute abdominal pain which may occur during battle
  (iv) Urinary frequency, particularly at night, or urinary incontinence during actual battle
  (v) Inability to control bowel functions may occur under catastrophic combat stress
(e) Circulatory and respiratory system reactions
  (i) Heart palpitations
  (ii) Elevated blood pressure and increased pulse rate
  (iii) Chest pains or pressure
  (iv) Hyperventilation (rapid respirations), shortness of breath, dizziness, and/or choking sensation
  (v) Sensations of faintness or giddiness combined with decreased muscle strength and energy
(f) Sleep disturbances
  (i) Difficulty in falling asleep or inability to sleep when the tactical situation permits
  (ii) Nightmares, terror dreams, or battle dreams
  (iii) Sleep disturbances in the form of dreams are part of the normal psychological healing
  (iv) This process of "working through" combat experiences is a way to increase tolerance
(g) Hyper alertness--frequent startle reactions-(jumping, crying, jerking or other forms of involuntary self-protective motor responses to sudden noises)
(h) Irritability
  (i) Verbal flare-up, and tears are common overreactions to normal, everyday comments or incidents
  (ii) Sporadic and unpredictable explosions of aggressive behavior with little or no provocation. The stimulus may be a noise, an accidental bumping or a normal conversation.
(i) Short attention span
(j) Depression
  (i) Low energy level
  (ii) Social withdrawal
  (iii) Poor personal hygiene
(k) Substance abuse

(2) Disruptive reactions.
(a) Soldier or supervisor states that the soldier cannot function on the job

(b) Soldier or supervisor states that the soldier may compromise their own safety and the safety of others
(c) Soldier exhibits panic (rushing about without any self-control)
(d) Soldier may have visual and/or hearing problems (perceived by the individual) and partial paralysis. Paralysis is usually confined to one arm or leg
(e) Soldier may utter incoherent language. Soldier may babble, be unable to speak logically, and have a bewildered appearance.
(f) Soldier or soldiers' supervisor states loss of appetite, which resulted in loss of 5 pounds per week or more
(g) Soldier complains of persistent and severe abdominal pain
(h) Soldier has inability to control bowel function after stress stimulus (combat) has ended

Principles of Battle Fatigue Treatment--(PIES)

CAUTION: Failing to follow the principles of treatment could result in the soldier not recovering from battle fatigue and may set him up for a lifetime of problems with a chronic psychiatric disability.

Proximity--treat soldiers as close as possible to their units and battle. Prevent over evacuation.

Immediacy--identify need for care early and treat immediately

Expectancy--provide positive outlook to combat fatigue casualty. Casualty should expect full recovery and early return to duty (RTD). The most important principle of treatment.

Simplicity--use simple, brief straightforward methods to restore physical well being and self-confidence using non-medical terminology and techniques.

Battle Fatigue Treatment Steps and Evacuation Guidelines

CAUTION: DO NOT refer to the soldier as a "patient", because calling him a patient reinforces to him that he is sick.

(1) Treatment steps
  (a) Obtain brief medical/mental status exam and rule out serious medical/mental illness or injury
  (b) Provide a place for the soldier to rest. At least 4 hours rest should be provided in a quiet, secure area
  (c) Provide food, when available
  (d) Provide an opportunity for the soldier to discuss his feelings
(2) Evacuation guidelines

(a) Evacuate the soldier if he shows signs of disruptive battle fatigue reactions. Soldiers who have undergone 48 hours of treatment without resolution of symptoms should be evacuated for definitive psychiatric care. Carefully apply physical restraints if soldier is at risk of hurting self or others.

(b) Return the soldier to duty if he is able to function on the job. Returning him to his original unit (and to his original job) is the best mental health assistance that can be provided and is the "treatment of choice"

Administrative Classifications

(1) Duty--soldier needs brief time to recuperate in local area (up to 6 hours)

(2) Rest--soldier needs temporary removal from maneuvering unit for a few days (1 or 2 days)

(3) Hold--soldier needs medical observation and assistance

(4) Refer--soldier cannot be safely held or treated at Forward Support Medical Company (FSMC). Normally sent to Division Support Area (DSA) for evaluation and disposition.

Depression and Manic Depression

Symptoms of Depressive Illness

(1) Loss of energy and interest
(2) Diminished ability to enjoy oneself
(3) Decreased -- or increased -- sleeping or appetite
(4) Difficulty in concentrating; indecisiveness; slowed or fuzzy thinking
(5) Exaggerated feelings of sadness, hopelessness, or anxiety
(6) Feelings of worthlessness
(7) Recurring thoughts about death and suicide

Manic-depressive Illness

Manic Depression causes mood swings creating periods with the following symptoms:

(a) A high energy level with decreased need for sleep
(b) Unwarranted or exaggerated belief in one's own ability
(c) Extreme irritability
(d) Rapid, unpredictable emotional change
(e) Impulsive, thoughtless activity, with a high risk of damaging consequences (i.e., stock speculations, sudden love affairs, etc.)

TERMINAL LEARNING OBJECTIVE:

Identify requirements and responsibilities for a suicide prevention and awareness program.
Conditions: You are simulating serving as a unit leader who is responsible for implementing a suicide prevention program and for referring a possible suicidal individual for professional help. Necessary equipment and materials: Student Handout HO081-P-9028.
Standards: Identify the responsibilities and requirements of a suicide prevention awareness program to include: three warning signs of suicide, ten possible characteristics of suicide or suicidal behavior, seven steps to prevent a possible suicide, and referral agencies to support a suicidal individual.

Statistics

There are 30,000 suicides per year in the U.S. or about one every 20 minutes for a total of 75 per day. That averages about 12.5 per 100,000. Suicide is ranked the eighth overall cause of death in the United States after heart disease, cancer, stroke, accidents, pneumonia, diabetes, and cirrhosis

The rate per 100,000 soldiers varies with the lowest rate in 1987 and the highest rate in 1993. 75 percent of the suicides were by self-inflicted gunshot and 17 percent were by hanging. The "typical" Army suicide in 1995 was a white male between the ages of 20 and 25 years of age.

Resources and Responsibilities:

Suicide prevention is everyone's respons bility. The Army has developed a policy for implementation of a prevention program. Commanders and their staff have certain obligations toward suicide prevention.

Policy

(1) Commanders are required to establish a suicide prevention program at every Army installation or community and separate activity in accordance with AR 600-63.

(2) An education awareness program for both military and civilian leaders, managers, and supervisors, as well as family members include:

(a) Suicide risk identification.
(b) Procedures for crisis intervention.

(3) Training will be integrated into every Army leadership development course conducted by the Army school system.

(a) NCOES.
(b) Officer leadership courses.
(c) Unit level officer and NCO professional development courses.

(d) Installation level course for civilian supervisors and designated civilian personnel office personnel.

(4) Chaplains (Unit Ministry Teams (UMTs)) will provide suicide prevention/education awareness training to:
(a) Active duty soldiers.
(b) Civilian personnel.
(c) Family members.
(5) Mental health officers will:
(a) "Train the trainers".
(b) Provide technical expertise for all suicide prevention/education awareness training.
(6) Mental health officers and UMT resources will:
(a) Provide assistance to organizations and their members following the suicide of a soldier or army civilian.
(b) Provide assistance for families who have experienced the loss of a family member to suicide.

(7) Psychological Autopsy required by AR 600-63 paragraph 5-8.

(a) The purpose of a psychological autopsy is to provide the victims commander with information about the death and to enable the unit and the Army to determine further prevention programs and lessons learned so that soldiers and family members are better served.
(b) Psychological autopsies are a thorough, retrospective investigation of the intention of the victim relating to his or her being dead. The information for the autopsy is obtained by interviewing individuals who knew the victims actions, behavior, and character well enough to report on them.
(c) Conducted by a mental health officer.
(d) For an active component soldier, or reserve component soldier on active duty or active duty for training.
(e) When death is a result of suspected suicide, an accident involving unusual circumstances or cannot be established as natural, accidental or homicide.
(f) The reports are prepared IAW DA PAM 600-24.

Warning Signs of Suicide

Suicide is not a bizarre and incomprehensible act of self-destruction. Suicidal people use a particular logic, a style of thinking that brings them to the conclusion that death is the only solution to their problems. Eight of ten persons who eventually kill themselves give warnings of their intent. Fifty percent say openly that they want to die.

Warning signs include suicide threats, precipitating events, and emotional disturbance which usually precede either suicide or a suicide attempt.

(1) Warning signs of suicide could include any of the following suicide threats:
(a) "I can't take it."

(b) "You won't have to worry about me."
(c) "I want to go to sleep and never wake up."
(d) "I won't be a problem to you anymore."
(e) "Everyone would be better off if I was dead."
(f) "They'll be sorry when I'm gone"
(g) "I don't want to live anymore."
(h) "Soon this pain will be over."
(i) "I'm going to kill myself."

(2) Events which may precede suicide or a suicide attempt are the following:
(a) Illness.
(b) Economic distress.
(c) Employment difficulties.
(d) Death of a loved one.
(e) Domestic difficulties.
(f) Divorce.

(3) Indicators of emotional disturbance, include:
(a) A loss of appetite or sudden overeating, insomnia, or excessive sleeping over a period lasting at least several days.
(b) Frequent complaints about physical symptoms that are often related to emotions (such as stomachaches, headaches, constant fatigue, frequent drowsiness).
(c) Unusual neglect of personal appearance.
(d) Prolonged boredom in their surroundings and with activities that had previously been enjoyed.
(e) Withdrawal and isolation from friends and family, becoming loners who are unable to give of themselves or to make a real commitment to a relationship.
(f) Difficulty in concentration with a decline in the quality of work.
(g) Preoccupation with themes of death.
(h) A lack of planning for the future. Making comments similar to the following: "Why worry about me? I could be dead tomorrow."
(i) Abrupt outbursts of anger, "jumping" at little things. Instead of controlling their moods, their moods control them.

Characteristics of Suicide

In addition to the warning signs common to suicidal behavior, there are several characteristics which are associated with suicide that can be used to help identify soldiers who might be contemplating suicide. The characteristics provide some understanding of the emotional state of a suicidal person and offer insight into what might motivate someone to harm him or herself.

Characteristics of suicide or suicidal behavior that can be related to specific situations are the following:

(1) Unbearable emotional pain.
(2) Frustrated emotional needs. Everyone has needs for security, achievement, trust, and friendship. Frustration in meeting those needs results in emotional pain.

(3) The search for a solution. Suicide is not random; it is never done pointlessly or without purpose. It is a perceived way out of a problem, a crisis, or an unbearable situation. It seems to be the only available answer.
(4) An attempt to end consciousness. Suicide is both a movement away from pain and a movement to unconsciousness. The aim of suicide is to stop awareness of a painful existence.
(5) Shame, guilt, frustration, anger and other feelings have all been proposed as "real" causes of suicide. However, underlying all of these is a sense of powerlessness.
(6) Constriction of options. Suicidal individuals think of only two alternatives: a total solution or a total end.
(7) Ambivalence. Some ambivalence is normal; but for a suicidal person, ambivalence is a matter of life and death.
(8) Communication of intent. About 80 percent of suicidal people give clues about their intention to kill themselves.
(9) Departure. Running away from home, quitting a job, and abandoning a spouse are all departures; but suicide is the ultimate escape.
(10) Look at previous episodes of disturbance, and the person's history of handling emotional pain.

Steps to assist in the prevention of suicide

As an Army leader you should become familiar with the steps which could assist in the prevention of suicide. Suicidal thoughts and behavior are often cries for help.

Steps which could assist in the prevention of suicide are the following:

(1) Ask if anything is wrong. Suicidal thoughts and behavior are often cries for help. Most suicidal people will open up during this time of need.
(2) Take threats seriously. The warning signs given by many people are very subtle; trust your suspicions. Once you are alerted to the clues that may support a cry for help, you can help in several ways. Do not ignore the issue.
(3) Confront the problem. If you suspect that a person is suicidal, begin by asking non-judgmental questions such as "Are you feeling depressed?" or "How long have you felt this way?" These questions give the person a chance to vent feelings. Don't be afraid to ask the person if he or she is thinking about committing suicide. Asking about suicide won't put the idea into someone's head. Getting people to talk about wanting to kill themselves is a positive step.
(4) Offer support. Persons who attempt suicide most often feel alone, worthless, and unloved. You can help by letting them know that they are not alone, that you are there for them to ta k to and others do care about them. Don't make moral judgments, act shocked, or make light of the situation. Don't tell people they have everything to live for because that may deepen the sense of guilt which they probably already feel. Don't tell them to snap out of it; that's l ke telling someone with two broken legs to get up and walk. The most useful thing you can do is encourage the suicidal person to get professional counseling and consider a referral.
(5) Don’t leave them alone. Avoid leaving anyone alone if you believe the risk of suicide is probable.

(6) Remove suicidal person from lethal weapons. A suicidal soldier may also surrender weapon(s)
(7) Get professional help. The most useful thing that you can do is to get suicidal persons professional help. Don't assume anyone isn't the suicidal "type." Don't keep a deadly secret, tell someone what you suspect.

Referral and Support Agencies

Once you have identified someone who might be at risk for suicide, there are a number of agencies which can assist you in getting help for the individual. In fact, all psychiatric emergencies, including self-harming behavior, should be automatically referred for professional intervention.

Support agencies which will assist in preventing a soldier from committing suicide are the following:

(1) Division Mental Health Service.
(2) Community Mental Health Service.
(3) Hospital emergency room.
(4) Chaplains.
(5) Social Work Service.
(6) Army Community Services .

Emergency Referrals. Commanders consider a soldier in an emergency status when:

(1) There appears to be an immediate threat to life or limb of the service member.
(2) The intent for suicide is sincere and the lethality of the method under consideration is high (for example, firearms, hanging).
(3) For an emergency referral contact a mental health professional for a phone consultation and/or escort the soldier (by a unit member or a Military Policeman) to a mental health professional for an evaluation or escort the soldier immediately to the emergency room. Required form can be completed retroactively if not before.

Non-emergency referrals

(1) Commanders (acting Commanders) shall consult with a mental health professional before referring a service member for a non-emergency evaluation on an outpatient basis.
(2) The service member will be counseled and provided a copy of the referral that includes information in accordance with Department of Defense (DOD) Directive 6490.1" or (time and date of appointment, name of the professional consulted and a description of behaviors or statements resulting in the referral and other information as required.
(3) The service member has certain rights when referred for a mental health evaluation. For example he or she may request a DOD Attorney, they may get a second evaluation with a professional of their choice and exercise other administrative options, Commanders will be familiar with these rights.

TERMINAL LEARNING OBJECTIVE

Given a prepackaged needle, syringe, and medication. Performed basic nursing care for casualty without causing further injury or illness.

Parts of a Needle and Syringe

Needle

(1) Parts
- (a) Lumen - hollow cavity inside of needle
- (b) Bevel - cutting edge of needle
- (c) Hub - point of attachment to syringe
- (d) Cannula (shaft) - needle length
- (e) Protective cover

(2) Needle characteristics
- (a) Stainless steel, sharp and shiny
- (b) Standard lengths are from 1/4 inch to 3 inches
- (c) Length is determined from the tip of the point to the junction of the shaft and hub

Syringe

(1) Barrel - clear plastic or glass that has calibrated scales on it. The inside of barrel is sterile

(2) Plunger - movable portion inside of barrel. The rubber portion and the shaft are sterile

(3) Needle adapter - portion of syringe where needle attaches, this part is also sterile

(4) Calibrated scales - markings vary from .01 ml on 1 cc syringes to 0.2 ml on 3-5 cc and 05 ml on 10 cc and larger syringes, always check the calibrated markings

Inspecting Equipment for Contamination and/or Deterioration

Paper wrappers

Checked for tears, water spots, and signs of deterioration or contamination
If any of these signs are present, discard, and replace
Plastic caps on needles and syringes should NOT have been opened prior to use.
If needle or syringe covers appear to be loose, discard and replace

Equipment

(1) Sterile syringe(s)
(2) Appropriate size needles, to include extra needles
(3) Alcohol sponge (alcohol prep pad)
(4) Proper container for disposal of needle/syringe (sharps container)
(5) Correct medication, ampule or vial

Assembling needle and syringe

(1) Remove syringe from package without contaminating sterile parts (needle adapter or plunger)

(a) If the syringe is packaged in a flex ble wrapper, peel the sides of the wrapper apart to expose the rear end of the syringe barrel
(b) If the syringe is packaged in a hard plastic container, press down and twist the cap until a distinct "pop" is heard
(c) If the "pop" is not heard, the seal has been previously broken, and the equipment must be discarded

(2) Ensure plunger of syringe moves freely by grasping the flared end of the syringe and pulling the plunger back and forth. If the syringe does not move freely, replace it with another sterile syringe

CAUTION: The shaft of the plunger is sterile. Contamination could cause infection in the patient. Touch only the end of the plunger when testing for free movement.

(3) Remove needle from package without contaminating sterile parts (needle hub or shaft)
(a) If the needle is packaged in a flexible wrapper, peel the sides of the wrapper apart to expose the needle hub
(b) If the needle is packaged in a hard plastic container, twist the cap until a "pop" is heard. Remove the cap to expose the needle hub
(c) If the "pop" is not heard, the seal has been previously broken, and the equipment must be discarded

CAUTION: All parts of the needle are sterile. Be careful not to touch the hub to prevent contamination. Only the outside of the needle cover may be touched.

(4) Join needle and syringe by inserting needle adapter of the syringe into the needle hub, without contaminating either part. Tighten the needle by turning one fourth of a turn to ensure that it is securely attached. If the syringe has threads, you may need to turn more than the quarter turn.

(5) Hold the needle and syringe upright and remove the protective cover from the needle by pulling it straight off

CAUTION: Do not twist the protective cover because it may pull the needle off the hub.

(a) Visually inspect the needle for burrs, barbs, damage, and contamination
(b) If the needle has any defects or damage, replace the needle with another sterile needle

(6) Place the protective cover back on the needle being careful not to stick yourself or to contaminate the needle. Place the assembled needle and syringe on the work surface

(7) When you assemble a needle and syringe, you are responsible for maintaining sterility and security of the equipment

Steps to Utilized Prior to Drawing up Medications

Compare drug name on the container with the doctor's orders

Compare drug concentration with the doctor's orders

Check expiration date on medication container

The medication label must be verified three times

(1) When obtaining medicine container from place of storage
(2) When withdrawing medication from the container
(3) When returning the medication container to storage

If any of the following defects are noted on a vial, follow directions IAW local SOP or return to pharmacy

(1) Examine the rubber stopper for defects, such as small holes resulting from wear and tear
(2) Hold the vial to the light to check for foreign particles and changes in color and consistency of medication to be drawn
(3) Check expiration date and date medication was opened on a multidose vial

WARNING: Refer to manufacturer's instructions for expiration of medication prior to and after opening vial. Follow local SOP if discrepancies are noted between SOP and manufacturer's instructions. If in doubt, consult supervisor, nurse on duty, or pharmacy.

(4) Determine whether the medication is stored properly, e.g., shelf or room temperature vs. refrigeration
(5) Refer to manufacturer's instructions for proper storage of medication

Prepare and draw medication

(1) Select the appropriate needle
  (a) Length will depend on the following factors
    (i) Type of injection to be given (intramuscular, subcutaneous, intradermal)
    (ii) The size of the patient (thin, obese)
    (iii) The site of injection
  (b) Choice of needle gauge depends upon the viscosity (thickness) of the medication
(2) The gauge of the needle is indicated by the numbers 14 through 28. The higher the number, the smaller the diameter (bore) of the needle
  (a) Small-bore needles are indicated for thin medications (watery medications)
  (b) Large bore needles are indicated for thick medication

Drawing Medication from an Ampule

(1) Lightly tap the upright ampule to force any trapped medication from the ampule neck and top
(2) Clean neck of ampule with alcohol sponge (prep pad)
(3) Wrap neck of ampule with same sponge (prep pad)
(4) Grasp ampule with both hands and snap the neck by bending it away from the break line (the narrowest portion of ampule neck is the weakest point and breaks easily); DIRECT BREAKING AMPULE AWAY FROM SELF AND OTHERS
(5) Hold ampule to light - inspect for minute glass particles. If glass is present, discard and replace
(6) Pick up assembled needle and syringe in dominant hand and remove protective cover with free hand

CAUTION: Filter needles are used when drawing this type of medication. Follow local protocol.

(7) Hold ampule vertically with non dominant hand or place the ampule upright on a flat surface. Insert the needle and withdraw the medication
(8) Withdraw the prescribed medication, being careful not to touch the outside edge or bottom of the ampule with the needle
(9) Withdraw the needle and verify the correct dosage
(10) Expel any air bubbles present in the syringe
(11) Hold the syringe with the needle pointing up and pull back on the plunger slightly to clear all the medication from the needle shaft
(12) Tap the barrel lightly to force bubbles to the top of the barrel
(13) Pull the plunger back slightly and push it forward until the solution is in the needle hub, clearing it of bubbles
(14) Verify the correct dosage
(15) Recap the needle without contaminating it or sticking yourself with it
(16) Recheck ampule label and physician's orders to verify that the correct medication and dosage is drawn

WARNING: Anyone accidentally stuck with a needle must follow infection control protocol for needle sticks immediately!

Drawing Medication from a Stoppered Vial Which Contains a Prepared Solution

(1) Remove protective metal cap
(2) If this is a multidose vial, the metal cap may have already been removed

(3) Cleanse the rubber stopper with an alcohol sponge (alcohol prep pad)

CAUTION: Premixed medications may have to be shaken or "rolled" in your hands to ensure that the medication is re-

suspended in the solution. Check medication label for instructions.

(4) Pick up the assembled needle and syringe with dominant hand and remove the protective cover with nondominant hand
(5) Slowly draw plunger to the prescribed cc mark of medication
(6) Pick up the vial with free hand and insert the needle into rubber stopper. Ensure the needle tip passes completely through

CAUTION: A filter needle may be used for this procedure. Follow local protocol.

(7) Push the plunger fully into barrel to inject air from syringe into vial
(8) Invert the vial keeping the needle and syringe inserted
(9) Pull the plunger back to the desired cc mark, withdrawing the prescribed medication
(10) Withdraw needle from vial
(11) Expel any air that may be in syringe
(12) Verify correct dosage against the doctor's orders
(13) Hold syringe at eye level
(14) Ensure forward edge of plunger is exactly on the prescribed cc mark
(15) Recap needle carefully or change needle if necessary
(16) Return vial to proper area
  (a) Storage if it is a multi dose vial. Ensure date and time vial opened is recorded on the vial label
  (b) Dispose of single dose vial or if vial is empty IAW local SOP

Reconstitution of Powdered Medication

Receive doctor's orders (medication, route, dosage)

Select correct medication and correct diluent from storage area

(1) Normally, the powdered medication is packaged with its diluent in the same box. If no diluent is present, check the powdered medication label for diluent to be used
(2) Remove protective metal cap on stoppered vials (medication and reconstitution fluid)
(3) Clean the stoppers on both vials with alcohol sponges

Withdraw correct amount of diluent required to reconstitute medication

CAUTION: If the vial with powdered medication contains air, the diluent may be difficult to inject. Air may have to be withdrawn to allow the diluent to be injected.

Reconstitute medication

(1) Hold powdered medication vial horizontally, insert the needle through the stopper, and inject the diluent

(2) Withdraw needle from stopper
(3) Gently invert the vial several times until all the powder is dissolved

CAUTION: Check the medication vial label or package insert. Some medications can only be inverted gently, some require vigorous mixing.

Check medication for abnormalities that may be present.

(1) Refer to enclosed manufacturer's insert for acceptable variations in medication.
(2) If insert is unavailable or if you have any questions, check with supervisor or nurse on duty prior to injecting patient with medication.

Change the needle (or needle and syringe) to the appropriate size for route of administration and withdraw reconstituted solution from vial

(1) Pull the plunger back to the predetermined medication amount
(2) Insert needle into reconstituted solution
(3) Inject the air in the syringe into the vial
(4) Withdraw the prescribed amount of medication; keep needle immersed in solution when drawing medication into barrel of syringe
(5) Withdraw the needle from the vial
(6) Verify the correct dosage

Check syringe for air bubbles

TERMINAL LEARNING OBJECTIVE

Give the necessary medical equipment in a holding or ward setting. You are providing casualty care as part of an integrated team in a Minimal Care Ward. Performed basic nursing care for casualty without causing further injury or illness.

Purpose, Needle Characteristics, and Sites for Intra-muscular (IM) Injections

Purpose

(1) Utilized when rapid absorption/rate of onset (10-20 minutes) and long duration (hours to weeks) are desired
(2) Used when administering viscous or irritating medications
(3) Used when a large volume of medication is needed for a stronger effect

WARNING: Absorption of medications administered by the intramuscular route relies on adequate blood flow to the muscles, IM injections should not be used in individuals with poor circulation or symptoms of shock.

Needle characteristics

(1) Not less than one inch for an adult. You may use a smaller size if the patient is thin
(2) May need up to a 2 inch needle for obese patients

CAUTION: Selection of a needle long enough to reach the muscle is essential. Using a needle, which is too short, will cause the medication to be injected into subcutaneous tissue, potentially reducing absorption and effectiveness.

(3) Gauge (diameter) range, 20-22

Primary IM injection sites

(1) Deltoid muscle
  (a) Used for medication volumes up to 2 ml. in an adult
  (b) Faster absorption than other IM sites
  (c) Muscle is located in the outer one-third of arm between the shoulder bone (acromion process) and axilla
  (d) Injection site is approximately three finger-widths below the shoulder bone, in the middle of the deltoid muscle mass
(2) Gluteus maximus
  (a) Used for larger medication volumes, up to 5 ml.
  (b) May require a long needle (two inches or longer in large adults)
  (c) Located by dividing one buttock into four imaginary quadrants - injection area is in upper, outer quadrant

CAUTION: An injection given in an area outside this site could cause damage to the sciatic nerve or puncture the superior gluteal artery, causing

either paralysis or severe bleeding. Use extreme care when identifying the gluteal site!

(3) Vastus lateralis
- (a) One of the safest sites due to absence of major nerves and blood vessels
- (b) May be more painful due to number of small nerve endings
- (c) Medication volume up to 5 ml. in adults
- (d) Muscle mass is on lateral thigh
- (e) Injection site extends from the middle of the anterior thigh to the middle of the lateral thigh, and from one hand's width below the hip joint to one hand's width above the knee

NOTE: Length and gauge selected will vary depending on the amount of muscle mass, age, size, and condition of patient

Purpose, Needle Characteristics, and Site for Subcutaneous (SQ) Injections

Purposes

(1) Utilized when absorption rate desired is slower than IM route. Absorption rate for SQ injection is 15-30 minutes. Duration is comparable to IM route - hours to weeks.

(2) Used for small amounts of watery and nonirritating medications

Needle characteristics

(1) Length ½" to 1"

(2) Gauge (diameter) range, 23 to 25

(3) Selection of needle length and gauge will vary depending on the amount of subcutaneous tissue, age, size, and condition of patient.

Sites

(1) Upper arm
- (a) Rear lateral aspect
- (b) Injection area is approximately one-hand width down from the shoulder and one-third of the way around laterally.
- (c) Medication volume - not to exceed 0.5 ml

(2) Vastus lateralis
- (a) Injection site extends from the middle of the anterior thigh to the middle of the lateral thigh, and from one hand's width below the hip joint to one hand's width above the knee.
- (b) Medication volume - not to exceed 2 ml

(3) Abdomen
- (a) Medications such as insulin and heparin are administered in the subcutaneous tissue of the abdomen.
- (b) The amount of medication given will vary according to the needs of the patient
- (c) A physician will prescribe the dosage to be given in the abdomen

Preparation and Administration of Intra-muscular and Subcutaneous Injections

Preparation

(1) Identify the patient
(2) Verify the required injection(s)
  (a) Check the physician's order
  (b) Review the patient's medical record to identify allergies and previous reactions to medications
  (c) If immunizations are to be given, carefully screen the immunization record (SF 601), located inside the medical record) and/or international shot record (PHS 731), for dates of previous immunizations/boosters.
(3) Verify compatibility of medications if multiple injections are ordered
(4) Ensure emergency equipment and personnel are available

WARNING: Have an emergency tray available for the immediate treatment of serious reactions. Include a constricting band and syringe containing a 1:1000 solution of epinephrine.

(5) Wash hands
(6) Identify route of delivery and select the injection site
  (a) Route of delivery for medication will be indicated in the order and/or the medication container
  (b) Be sure to select the appropriate site for the medication ordered to assure rate of onset and duration are as intended by the provider
(7) Gather equipment (appropriate size needle, syringe, and type of medication) and prepare medication
(8) Don gloves
(9) Position patient with selected injection site exposed

CAUTION: All injection sites must be completely exposed prior to injection. Clothing which prevents access to injection site for visualization, cleaning, and administration of injection will be removed, and patient privacy assured by using a sheet, towel, or pad to cover exposed areas/or using privacy screens.

  (a) Upper arm - standing or sitting with arm at side, muscles relaxed and area completely exposed
  (b) Gluteus maximus - lying face down or leaning forward and supported by a stable object with the weight shifted to the leg that will not be injected. The area is completely exposed
  (c) Vastus lateralis - lying supine or seated. Injection area completely exposed

CAUTION: It is permissible to use a standing position for injections. However, some patients even young, healthy soldiers may experience a vasovagal response to an injection and become dizzy or lose

consciousness. The seated or lying positions are therefore preferable.

(10) Cleanse the injection site with an alcohol prep pad, beginning in the center of the site and with a circular motion, clean outward approximately 3 inches

(11) Place alcohol prep pad between ring and little finger of non-dominant hand for use after the injection

Administration

(1) Pull needle cover/cap straight off and dispose of it in a waste receptacle

(2) Isolate the injection site
- (a) IM Injections - grasp the muscle mass with thumb and fingers of the non-dominant hand and hold it firmly in place.
- (b) SQ injections - gently pinch the skin with the thumb and fingers of the non-dominant hand and hold it firmly in place.

(3) Hold syringe in the dominant hand between the thumb and index finger, and position the needle bevel up and about ½ inch from the skin surface

(4) Inject medication
- (a) IM injections - hold syringe at a 90-degree angle to the site and plunge the needle straight into the muscle to the depth of the needle. Hand position will be similar to holding a dart
- (b) SQ injections - hold syringe at a 45-degree angle. Hand position will be similar to holding a pool cue

(5) Release hold on the skin with the non-dominant hand

WARNING: Failure to aspirate may cause the medication to be injected directly into the bloodstream.

(6) Aspirate by pulling back slightly on the plunger of the syringe
- (a) If blood appears, stop the procedure. Dispose of the needle and syringe in a sharps container, prepare a new set, select a different injection site, and begin again
- (b) If no blood appears, continue the procedure

(7) Using a slow, continuous movement, completely depress the plunger, injecting the medication

(8) Place either an alcohol pad or sterile gauze pad lightly over the injection site and withdraw the needle at the same angle in which it was inserted

(9) Gently massage the site, unless this is contraindicated for the type of medication that has been injected. Place an adhesive bandage over the injection site

(10) DO NOT RECAP THE NEEDLE; drop the used needle and syringe into the sharps container

(11) Record the administration of the injection on the appropriate documents
(12) Either have the patient wait for at least 20 minutes or IAW local SOP and monitor for adverse reactions

Intra-dermal (ID) Injections

Purpose

(1) Testing sensitivity (allergy testing) to environmental allergens, medications
(2) Testing for exposure to diseases (e.g., tuberculosis, mumps)
(3) Evaluation of the immune system (e.g., AIDS and cancer patients)

Equipment

(1) Needle
  (a) Needle length - ¼" to ½"
  (b) Gauge diameter range - 25 to 27
(2) Tuberculin or other 1.0 ml syringe

Sites

(1) Free of hair, tattoos and scars
(2) NOT over a vein or bony area
(3) Inner forearm - inner, flat portion (Primary injection site for ID)

NOTE: This is the preferred site for tuberculin testing and most other ID injections routinely given by the soldier medic.

(4) Back of upper arm
(5) On the back below the shoulder blades

Procedure for intra-dermal injection

(1) Preparation
  (a) Identify patient
  (b) Verify injection
  (c) Verify compatibility of medications if multiple injections are ordered
  (d) Assure availability of emergency equipment and personnel
  (e) Wash hands
  (f) Select injection site
  (g) Gather equipment and prepare medication
  (h) Don gloves
  (i) Clean the area with an alcohol prep pad or acetone in a spiral motion, clean outward 3 inches
  (j) Position patient with injection site exposed
    (i) Inner forearm - standing, sitting, or supine. Palm up with the arm relaxed and supported

(ii) Back of upper arm - standing or sitting
(iii) On the back - prone or seated and leaning forward with body supported by a stable object

(k) Pull needle cover/cap straight off and dispose of it in a waste receptacle
(l) Using the thumb of the non-dominant hand, pull the skin below the injection site downward and hold it taut

(2) Administration
(a) Position the syringe with the needle bevel up, at a 15-20 degree angle to the skin surface
(b) Insert the needle just until the bevel is under the skin surface
(c) Gently release the skin tension held by the non-dominant hand
(d) Do not aspirate. Push the plunger slowly forward until all medication has been injected and a wheal (a round or elongated elevation of the skin caused by the injection of fluid under the dermis) appears at the site of the injection.
(e) The appearance of a wheal indicates that the medication has entered the area between the intra-dermal tissues.
(i) If a wheal does not appear, withdraw the needle completely from the arm at the angle of insertion, dispose of the needle and syringe in a sharps container, prepare a new set, and repeat the procedure in another site.
(ii) If a wheal does appear, continue the procedure
(f) Quickly withdraw the needle at the same angle that it was inserted
(g) Without applying pressure to the skin surface, cover the injection site with dry sterile gauze
(h) Instruct the patient not to scratch, rub, or wash the injection site
(i) If appropriate, instruct the patient when and where to have the test read IAW local SOP
(j) Discard the needle and syringe into the sharps container without recapping needle
(k) Check the site for bleeding and observe the patient for allergic reactions
(l) Record the procedure on the appropriate form

CAUTION: If this injection was given to determine sensitivity (PPD), follow local SOP for patient care and instructions for reading of the results in 48-72 hours.

Force Health Protection
Assemble a Needle and Syringe and Draw Medication
Appendix A
Competency Skill Sheets

Needle and Syringe

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____

Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Washed hand.	P / F	P / F	P / F
b.	Gathered equipment.	P / F	P / F	P / F
c.	Identified patient and asked about allergies/drug reaction and explained procedure.	P / F	P / F	P / F
d.	Donned gloves.	P / F	P / F	P / F
e.	Selected and prepped injection site. Cleaned in a circular motion outward to center.	P / F	P / F	P / F
f.	Exposed needle without contaminating shaft and hub.	P / F	P / F	P / F
g.	Gently pinched skin around injection site with non-dominant hand.	P / F	P / F	P / F
h.	With dominant hand, inserted needle (bevel up) into injection site at approximately 45 degree angle. Inserted to depth of the needle and released pinched skin.	P / F	P / F	P / F
i.	Aspirated syringe with hand used to firm tissue. If blood appeared, student withdrew needle and waits instruction from the instructor)	P / F	P / F	P / F
j.	Injected medication into the injection site but pushing plunger (with non-dominant hand) using slow, continuous motion until all medication was expelled.	P / F	P / F	P / F
k.	Placed an antiseptic pad just above the injection site with non-dominant hand and withdrew needle from the injection site with dominant hand with a quick movement at the same angle of insertion.	P / F	P / F	P / F
l.	Placed an adhesive dressing over the injection site.	P / F	P / F	P / F
m.	Disposed of equipment in designated area (needles in sharps container).	P / F	P / F	P / F
n.	Verbalized recording injection administration and observed the patient for any reactions.	P / F	P / F	P / F

Instructor Comments:

Draw Medication

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____

Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Washed hand.	P / F	P / F	P / F
b.	Compared drug name on container with MD/PA order.	P / F	P / F	P / F
c.	Compared drug concentration with MD/PA order.	P / F	P / F	P / F
d.	Checked expiration date on medication container.	P / F	P / F	P / F
e.	Examined drug container for defects (plugs torn from stopper, foreign particles and color changes)	P / F	P / F	P / F
f.	Removed protective metal cap	P / F	P / F	P / F
g. pad	Cleaned stopper and neck of vial with alcohol prep	P / F	P / F	P / F
h.	Picked up assembled needle and syringe with dominant hand and removed protective cover with non-dominant hand.	P / F	P / F	P / F
i.	Slowly drew plunger to the prescribed cc mark of medication	P / F	P / F	P / F
j.	Picked up vial with free hand and inserted needle into rubber stopper. Ensured that needle tip passes completely through the cap.	P / F	P / F	P / F
k.	Inverted the vial keeping the needle and syringe inserted.	P / F	P / F	P / F
l.	Pulled plunger back to nearest cc mark, withdrawing prescribed medication.	P / F	P / F	P / F
m.	Withdrew needle from vial.	P / F	P / F	P / F
n.	Expelled any air that may be in the syringe.	P / F	P / F	P / F
o.	Verified correct dosage against MD/PA orders. Held syringe at eye level.	P / F	P / F	P / F
p.	Recapped needle.	P / F	P / F	P / F
q.	Returned vial (if multi-dose) or disposed of vial (single dose) IAW SOP.	P / F	P / F	P / F

Instructor Comments:

Drug Reconstitution

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____

Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Received doctor's order (medication, route, dosage).	P / F	P / F	P / F
b.	Selected correct medication and correct diluent from storage area.	P / F	P / F	P / F
c.	Removed protective cap on stoppered vials.	P / F	P / F	P / F
d.	Cleaned the stoppers on both vials with an alcohol sponge.	P / F	P / F	P / F
e.	Withdrew correct amount of diluent required to reconstitute medication.	P / F	P / F	P / F
f.	Reconsituted medication. (1) Held powdered medication vial horizontally, inserted the needle through the stopper and injects diluent. (2) Withdrew needle from the stopper. (3) Gently inverts the vial several time until all powder is dissolved.	P / F	P / F	P / F
g.	Checked medication for abnormalities that may be present.	P / F	P / F	P / F
h.	Changed the needle to the appropriate size for route of administration and withdrew reconstituted solution from the vial. (1) Pulled the plunger back to the predetermined medication amount. (2) Inserted needle into reconstituted solution. (3) Injected air in the syringe into the vial. (4) Withdrew prescribed amount of medication; keeping needle immersed in solution when drawing medication into the syringe. (5) Withdrew needle from the vial. (6) Verified correct dosage.	P / F	P / F	P / F
i.	Checked syringe for air bubbles.	P / F	P / F	P / F

Instructor Comments:

Force Health Protection
Administer Intramuscular, Subcutaneous, and Intradermal Injections
Appendix B
Competency Skill Sheets

Intramuscular Injection

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Washed hand.	P / F	P / F	P / F
b.	Gathered equipment.	P / F	P / F	P / F
c.	Identified patient and asked about allergies/drug reaction and explained procedure.	P / F	P / F	P / F
d.	Donned gloves.	P / F	P / F	P / F
e.	Selected and prepped injection site. Cleaned in a circular motion outward to center.	P / F	P / F	P / F
f.	Exposed needle without contaminating shaft and hub.	P / F	P / F	P / F
g.	Grasped deltoid muscle with index finger and thumb of non-dominant hand (around the injection site)	P / F	P / F	P / F
h.	Positioned the needle (bevel up) at approximately 90 degree angle to the skin surface. Plunged the needle firmly and quickly in the muscle to the depth of the needle and released firmed tissue.	P / F	P / F	P / F
i.	Aspirated syringe with hand used to firm tissue. If blood appeared, student withdrew needle and waits instruction from the instructor)	P / F	P / F	P / F
j.	Injected medication into the injection site but pushing plunger (with non-dominant hand) using slow, continuous forward movement as far as plunger will go.	P / F	P / F	P / F
k.	Placed an antiseptic pad just above the injection site with non-dominant hand and withdrew needle from the injection site with dominant hand with a quick movement at the same angle of insertion.	P / F	P / F	P / F
l.	Massaged injection site with an antiseptic pad.	P / F	P / F	P / F
m.	Placed an adhesive dressing over the site.	P / F	P / F	P / F
n.	Disposed of equipment in designated area (needles in sharps container).	P / F	P / F	P / F
o.	Verbalized recording injection administration and observed the patient for any reactions.	P / F	P / F	P / F

Instructor Comments:

Subcutaneous

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Washed hand.	P / F	P / F	P / F
b.	Gathered equipment.	P / F	P / F	P / F
c.	Identified patient and asked about allergies/drug reaction and explained procedure.	P / F	P / F	P / F
d.	Donned gloves.	P / F	P / F	P / F
e.	Selected and prepped injection site. Cleaned in a circular motion outward to center.	P / F	P / F	P / F
f.	Exposed needle without contaminating shaft and hub.	P / F	P / F	P / F
g.	Gently pinched skin around injection site with non-dominant hand.	P / F	P / F	P / F
h.	With dominant hand, inserted needle (bevel up) into injection site at approximately 45 degree angle. Inserted to depth of the needle and released pinched skin.	P / F	P / F	P / F
i.	Aspirated syringe with hand used to firm tissue. If blood appeared, student withdrew needle and waits instruction from the instructor)	P / F	P / F	P / F
j.	Injected medication into the injection site but pushing plunger (with non-dominant hand) using slow, continuous motion until all medication was expelled.	P / F	P / F	P / F
k.	Placed an antiseptic pad just above the injection site with non-dominant hand and withdrew needle from the injection site with dominant hand with a quick movement at the same angle of insertion.	P / F	P / F	P / F
l.	Placed an adhesive dressing over the injection site.	P / F	P / F	P / F
m.	Disposed of equipment in designated area (needles in sharps container).	P / F	P / F	P / F
n.	Verbalized recording injection administration and observed the patient for any reactions.	P / F	P / F	P / F

Instructor Comments:

Intradermal Injection

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Washed hand.	P / F	P / F	P / F
b.	Gathered equipment.	P / F	P / F	P / F
c.	Identified patient and asked about allergies/drug reaction and explained procedure.	P / F	P / F	P / F
d.	Donned gloves.	P / F	P / F	P / F
e.	Selected and prepped injection site. Cleaned in a circular motion outward to center.	P / F	P / F	P / F
f.	Exposed needle without contaminating shaft and hub.	P / F	P / F	P / F
g.	Gently pinched skin around injection site with non-dominant hand.	P / F	P / F	P / F
h.	With dominant hand, inserted needle (bevel up) into injection site at approximately 45 degree angle. Inserted to depth of the needle and released pinched skin.	P / F	P / F	P / F
i.	Aspirated syringe with hand used to firm tissue. If blood appeared, student withdrew needle and waits instruction from the instructor)	P / F	P / F	P / F
j.	Injected medication into the injection site but pushing plunger (with non-dominant hand) using slow, continuos motion until all medication was expelled.	P / F	P / F	P / F
k.	Placed an antiseptic pad just above the injection site with non-dominant hand and withdrew needle from the injection site with dominant hand with a quick movement at the same angle of insertion.	P / F	P / F	P / F
l.	Placed an adhesive dressing over the injection site.	P / F	P / F	P / F
m.	Disposed of equipment in designated area (needles in sharps container).	P / F	P / F	P / F
n.	Verbalized recording injection administration and observed the patient for any reactions.	P / F	P / F	P / F

Instructor Comments:

91W10
Advanced Individual Training Course

Invasive Procedures Handbook

Department of the Army
Academy of Health Sciences
Fort Sam Houston, Texas 78234

Academy of Health Sciences
91W10
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Appendix B -Initiate and Manage an Intravenous Infusion, Competency Skill Sheets
- IV Infusion

TERMINAL LEARNING OBJECTIVE

Given the formula for determining an intravenous (IV) infusion rate, calculate IV flow rates in drops per minute IAW Ross and STP.

Basic Computations with Whole Numbers

Addition of whole numbers

(1) Line up numbers exactly.
(2) Carry numbers from one column to the next.
17 + 29 = 46

36 + 48 = 84

73 + 47 = 120

(3) Solve the following problems.
(a) 34 + 17 = 51
(b) 65 + 43 = 84
(c) 89 + 31 = 120

Subtraction of whole numbers

(1) Line up numbers correctly.
(2) The larger number always goes on top.
(3) Subtract correctly.
15 - 4 = 11

98 - 73 = 25

45 - 38 = 7

(4) Solve the following problems
(a) 34 – 17 = 17
(b) 65 – 43 = 22
(c) 89 – 31 = 58

Multiplication of whole numbers

(1) Line up the columns correctly
(2) Carry numbers as you multiply
(3) Add correctly.

15 x 6 = 90

11 x 42 = 462

14 x 12 = 168

(4) Solve the following problems.
(a) 22 x 11 = 242
(b) 13 x 9 = 117

(c) 14 x 56 = 784

Division of whole numbers

(1) Be accurate

(2) Be aware of zeroes

6 ⟌42 =

8 ⟌56 =

7 ⟌70 =

(3) Solve the following problems

(a) 5 ⟌65 =

(b) 3 ⟌78 =

(c) 3 ⟌871 =

Fractions

Proper fractions - numerator is less than denominator

Examples: 3/4, 1/2, 7/8

(1) Rules for solving proper fraction

(a) Reduce proper fraction to lowest term

(b) Divide numerator and denominator by the same number

(2) Example: 5/10 (5/5=**1**, 10/5=**2**)=**1/ 2**, 9/27 (9/9=**1**, 27/9=**3**)= **1/3**

Improper fractions - numerator is greater than denominator

Examples: 6/5, 11/5

(1) Rules

(a) Divide denominator into numerator

(b) Remainder becomes new numerator

(c) Place numerator over denominator

(d) Reduce to lowest term

(2) Example: 25/3 = **8 1/3**

Mixed Number--combination of whole number and a fraction

Examples: 1 ½ , 5 7/8

(1) Rules for solving mixed fraction

(a) Multiply whole number by denominator

(b) Add to numerator. This sum is the new numerator

(c) Place over the denominator

(d) Reduce to lowest term

(2) Example: 3 5/6=(3x6+5)=23/6=**3.833**

Decimals

A decimal number expresses less than a whole number

The decimal point is a dot

All numbers to the left of the decimal are whole numbers

All numbers to the right of the decimal are decimal numbers

The first number to the right of the decimal is tenths; the second is hundredths; the third is thousands

Examples: 5.125 is read **5** (whole number); point; **1** (tenths), **2** (hundredths), **5** (thousands)

If there isn't a whole number in a decimal answer, place a zero to the left of the decimal. Examples: 0.75, 0.2

Zeros at the end of a decimal number do not add value and may be eliminated. (Example: "2.0" may be written as "2")

In division, the divisor is the number following the "/" symbol and is placed outside the box. The dividend is the number to be divided and is placed inside the box. The answer is also referred to as the quotient.

When rounding, if number is 5 or greater, round up; if number is less than 5 round down.

3.43 + 16.021= **19.451** or **19.5**

5.053 - 2.09= **2.963** or **3.0**

5.02 x .6 = **3.012**

25.155 / .05= **503.1**

Calculate an IV Flow Rate

Information required to determine flow rate

(1) Total volume to be infused
(2) Time period over which it is to be infused
(3) Properties of the administration set (how many drops per milliliter it delivers). This information is found on the box containing the administration set.

Formula for calculating IV flow rate:

(1) $\frac{\text{Volume to be infused X Drops/ml of infusion set}}{\text{Total time of infusion in minutes}}$

TERMINAL LEARNING OBJECTIVE

Given list of exposure methods, select the primary means of exposure to bloodborne pathogens, exposure prevention to bloodborne pathogens and select the correct procedure for handling and disposal of contaminated material and needles IAW cited references.

Primary Means of Exposure to Bloodborne Pathogens

Injection under the skin by puncture wounds or cuts from contaminated sharps Contaminated blood entering non-intact skin; cuts, abrasions, burns, rashes, lacerations, ulcerations, or chapped/cracked hands.

Splashes from contaminated blood entering the mucous membranes of the eyes, nose, and mouth

Primary Means of Exposure Prevention to Bloodborne Pathogens

Wash hands

Protect and shield all potentially contaminated body areas with personal protective equipment

Complete all invasive procedures in a controlled, confident manner

Dispose of potentially contaminated materials immediately and carefully in provided biohazard receptacles

Use universal precautions with the following potentially infectious materials:

(1) Blood
(2) Semen
(3) Vaginal secretions
(4) Cerebrospinal fluid
(5) Synovial fluid
(6) Pleural fluid
(7) Any body fluid with visible blood
(8) Any unidentifiable body fluid
(9) Saliva from dental procedures

Handling and Disposal of Contaminated Material and Needles

Contaminated material handling and disposal

(1) Wear disposable gloves in areas that you may come into contact with blood or other potentially infectious materials
    (a) Immediately wash hands and replace gloves when torn or punctured
    (b) Immediately wash hands and replace gloves when gloves are covered with blood or other potentially infectious materials

(2) Dispose of all disposable materials such as gloves, gauze sponges, alcohol pads, and/or chux pads in regular trash. If they are grossly contaminated, dispose in a leak proof, red "Biohazard" bag.

NOTE: When gathering and disposing contaminated materials, always take extra time to look closely for any needles, ampules, or other sharp objects which may be hidden.

(3) Dispose of blood specimens in a container that prevents leakage (red "sharps" container)
(4) Dispose of non-contaminated items such as wrappers, needle covers, etc., in regular waste containers
(5) If a blood spill occurs, use decontamination procedures listed within the Bloodborne Pathogen SOP
(6) Specimens of blood will be placed in a container (such as a sharps container) which prevents leakage during handling, storage and transport
(7) Contaminated waste bags must be kept under lock at the AMEDDC&S and turned into AMEDDC&S CMS for disposal at the end of final testing for invasive procedures

Handling and disposal of contaminating needles

Contaminated needles or other contaminated sharps must not be bent or recapped.

(1) Wear gloves
(2) Dispose of needle and/or syringe immediately, by gently dropping it into a biohazard sharps container from a height no greater than six inches

Do not leave contaminated needle/syringe in area with chux and other disposables as this may increase the likelihood of needle sticks.

(3) A sharps container should be at every bedside in a hospital and next to each gurney during invasive procedures
(4) DO NOT place your hands into sharps container
(5) Close lid of sharps container when 3/4 full. DO NOT overfill.
(6) Dispose of sharps containers IAW Bloodborne Pathogen SOP
(7) If needles are to be removed from the syringe, use a hemostat or one-handed technique
(8) DO NOT attempt to push out a vacutainer needle using your fingers. The posterior needle is covered with a latex sheath that will puncture your finger if pressed.

TERMINAL LEARNING OBJECTIVE

Given the appropriate materials and sterile gloves, put on and remove sterile gloves without contaminating the gloves or self IAW cited references.

Steps for Patient Care Handwash (Routine)

Equipment

(1) Running water (sink and faucets)
(2) Handsoap (usually a germicidal agent in dispensers) IAW local SOP

Remove jewelry

CAUTION: Wearing rings in a patient care area should be minimized to reduce poss ble bacteria locations. If rings are worn, they should be plain and washed when hands are washed.

Stand in front of sink

Avoid leaning against sink. Turn on water and adjust temperature.

NOTE: Knee or foot pedals may be available on some sinks. Warm water is preferable to cold because it avoids chapping skin and removes skin oils.

Wash hands

(1) Thoroughly wet hands and forearms under running water
(2) Apply soap
(3) Wash hands, wrists, and lower forearm, using a circular scrubbing motion. Interlace fingers and rub hands back and forth.
(4) Given particular attention to creases and folds in the skin where microorganisms are difficult to dislodge. The duration of the patient care handwash should be a minimum of 10-15 seconds.

NOTE: Depending on reference used, duration will be from 10 seconds to as long as 2 minutes or longer, depending on the potential for contamination with microorganisms.

Rinse hands, wrists, and forearms

(1) Do not touch any part of the contaminated sink or faucets
(2) Rinse thoroughly with hands and wrists lower than elbow so that water runs from fingers to e bow

Dry hands, wrists, and forearms

(1) Dry thoroughly using clean paper towels
(2) Dry arm from the fingertips toward the elbows without retracing to keep the fingers and hands free of recontamination. Repeat the process for the other arm using another towel.
(3) Keep hands pointed upward
(4) Do not go back toward fingertips

(5) Dispose of the towels properly without dropping the hands below waist level

Dispose of drying material IAW local SOP - use trash container

Apply hand lotion (optional)--hand lotion aids in preventing skin from chapping

Procedures for Donning Sterile Gloves

Select and obtain proper size package of sterile gloves

Inspect the glove package for signs of contamination. Discard if you find any of the following:

(1) Water spots or moisture
(2) Tears
(3) Any other evidence of damage or contamination

Perform a patient care handwash

Open the sterile package

(1) Place the package on a flat, clean, dry surface in the area where the gloves are to be worn
(2) Peel the outer wrapper open to completely expose the inner package

Position inner package

(1) Remove the inner package touching only the folded side of the wrapper
(2) Position the package so that the cuff end is nearest to you

Unfold the inner package - Open the package to a fully flat position without touching the gloves

Expose both gloves

(1) Grasp the lower inside corners or designated areas on the folder
(2) Pull gently to the side without touching the gloves

Put on the first glove

(1) Grasp the cuff at the folded edge and remove it from the wrapper with one hand
(2) Step away from the table or tray
(3) Keeping the hands above the waist, insert the fingers of the other hand into the glove
(4) Pull the glove on touching only the exposed inner surface of the glove

NOTE: If there is difficulty in getting the fingers fully fitted into the glove fingers, make the adjustments after both gloves are on.

Put on the second glove

(1) Insert the fingertips of the gloved hand under the edge of the folded over cuff

NOTE: The gloved thumb may be kept up and away from the cuff area or may be inserted under the edge of the folded over cuff with the fingertips.

(2) Keeping the hands above the waist, insert the fingers of the ungloved hand into the glove
(3) Pull the glove on
(4) **Do Not** contaminate either glove

NOTE: Anything below the waist is considered contaminated.

Adjust the gloves to fit properly

(1) Grasp and pick up the glove surfaces on the individual fingers to adjust them
(2) Pick up the palm surfaces and work the fingers and hands into the gloves
(3) Interlock the gloved fingers and work the gloved hands until the gloves are firmly on the fingers

CAUTON: Avoid dropping your hands below waist level once your gloves are on.

Putting on gloves with a sterile gown (Closed gloving)

(1) Hands are covered with gown sleeves as another nurse or soldier medic opens the inner sterile gloves package
(2) With dominant hand inside gown cugg, pick up glove from dominant hand by grasping folded cuff
(3) Extend dominant forearm palm up and place palm of glove against palm of dominant hand. Glove fingers will point toward elbow.
(4) Grasp back of glove cuff with nondominant hand and turn glove cuff over end of dominant hand and gown cuff
(5) Grasp top of glove and underlying gown sleeve with covered nondominant hand
(6) Carefully extend fingers into glove, being sure glove's cuff covers gown's cuff
(7) Glove nondominant hand in same manner. Use gloved right hand to pull on the glove. Keep hand inside sleeve.

Removal of Gloves

Grasp one glove at the heel of the hand with the other gloved hand
Peel off glove, retaining it in the palm of the gloved hand
Reach under the cuff of the remaining glove with one or two fingers of the ungloved hand
Peel off the glove over the glove being held in the palm
Do not contaminate self
Discard the gloves according to local SOP. Wash hands.

TERMINAL LEARNING OBJECTIVE

Given a scenario, choose the appropriate patient management procedures associated with breaking the cycle of infection IAW cited references. Performed appropriate prevention and control of infection.

Modes of Escape/Means of Control

Respiratory tract (examples: Tuberculosis, common cold)
- (1) Breathing out (coughing, sneezing, etc.)
- (2) Means of control--covering nose and mouth

Gastrointestinal tract (examples: Hepatitis and Cholera)
- (1) Body secretions and excretions
  - (a) Secretions - Release of chemical substances manufactured by cells of glandular organs
  - (b) Excretions - Process of eliminating, shedding, or getting rid of substances by body organs or tissues, as part of a natural metabolic activity
- (2) Means of control--personal hygiene

Skin
- (1) Wound drainage
- (2) Means of control--personal hygiene, wound care

Genitourinary tract (examples: Syphilis, Gonorrhea, Urinary tract infections)
- (1) Body secretions and excretions
- (2) Means of control--personal hygiene gloves

Susceptible Hosts

Any person whose resistance to infection is insufficient to combat the invading infectious organism

High-risk individuals--persons who are very young, very old, malnourished, chronically diseased, receiving chemotherapy, ill, in shock, and persons with open wounds

Means of control
- (1) Standard precautions
  - (a) Handwashing
  - (b) Gloves
  - (c) Mask, eye protection, face shield
  - (d) Gown
- (2) Miscellaneous guidelines
  - (a) Ensure sharps are placed in a biohazard needle box
  - (b) Spills of blood or body fluids are cleaned up with 1:10 solution of bleach and water
  - (c) All soiled linen is placed in laundry bag

(d) Soldier medics with exudative (draining) lesions should refrain from direct patient care and from handling patient care equipment
(e) Separation of high-risk person from those with known or potential infections
(f) Separation of high-risk person from those with known or potential infections

Category-Specific Isolation Precautions

NOTE: In most cases when a private room is required, patients infected with the same organism may share a room

Strict isolation
(1) Prevent transmission of highly communicable disease spread by contact and airborne routes. Most restrictive of isolation measures
(2) Disease example–chickenpox, diphtheria, herpes
(3) Equipment--private room, mask, gown, and gloves will always be worn

Contact isolation
(1) Prevents serious diseases, infectious and/or conditions caused by highly contagious organisms that do not require strict isolation. Diseases are primarily spread by close or direct contact with patient or items used by the patient.
(2) Disease example–pediculosis, scabies, acute respiratory infections in infants and young children
(3) Equipment--private room, mask for close contact, gowns if there is potential for soiling, gloves if contact with infective material is likely

Respiratory isolation
(1) Reduces transmission of infectious diseases over short distances through the air by sneezing, coughing, or exhaling pathogens
(2) Disease example–measles, mumps, pneumonia, meningitis, or pertussis
(3) Equipment--private room and mask for close contact

Acid-fast bacillus (Tuberculosis) isolation
(1) Indicated for patients who have been diagnosed with tuberculosis
(2) Disease example–pulmonary or pharyngeal tuberculosis
(3) Equipment--private room (negative pressure room in level 3 hospital), mask with special filter, gown to prevent gross contamination

Enteric precautions
(1) Prevents infections that are transmitted by direct or indirect contact with feces
(2) Disease example--Hepatitis A, Salmonellosis, infectious gastroenteritis

(3) Equipment--private room if hygiene is poor, gowns if there is potential for soiling, gloves if contact with infective material is likely

Drainage and secretions precautions

(1) Prevent infections that are transmitted by direct or indirect contact with material or drainage from infectious body sites
(2) Disease examples–skin infection, wound, burn, abscess, conjunctivitis
(3) Equipment--gowns if there is potential for soiling, gloves if contact with infective material is l kely

Blood and body fluid precautions

(1) Prevent infections that are transmitted by direct contact with infected blood or body fluids.
(2) Disease example–AIDS, hepatitis B and C, malaria
(3) Equipment--private room if hygiene is poor, mask if contact with blood or body fluids is l kely, gowns if contact with splashes of blood or body fluids is likely, gloves if contact with blood or body fluids is likely

Protective (reverse) isolation

(1) Used for patients who are susceptible to disease, due to their low immunity status, low white blood cell counts. Measures are taken to prevent transmission of pathogens from the outside to the susceptible patient and his surroundings
(2) Disease example--leukemia, cancer chemotherapy, AIDS

Equipment--private room, mask, gown, gloves, and hair coverings

NOTE: Equipment needed will depend on type of isolation and specific order or hospital SOP.

NOTE: Isolation equipment is needed to protect hospital staff, visitors, and patients.

NOTE: Placards are placed on the door to the patient's room and contain specific instructions for hospital staff and visitors to follow prior to entering isolation area.

General Procedures of Isolation

Handwashing

(1) The single most important precaution to take to eliminate the spread of disease
(2) Before and after contact with each patient
(3) Use antiseptic soap/detergent. Keep non-disposable equipment (i.e., thermometers, B/P cuffs, etc) in isolation areas

Patient's charts are NOT taken into STRICT ISOLATION areas

Double bag all contaminated items when leaving isolation areas

Visitors

(1) Keep to minimum
(2) Explain isolation precautions to take before, during, and after visit
(3) Ensure precautions are followed at all times

Inform patients about potential of spreading their disease(s)

Principles of Universal Precautions

General precautions

(1) Wear gloves (See C191W054)
  (a) When touching blood or body tissue, body fluids containing blood and body fluids (semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, and amniotic fluid)
  (b) Handling items or surfaces soiled with blood or body fluids
  (c) Performing venipuncture and other vascular access procedures

NOTE: Blood is the single most important source of HIV, hepatitis B virus and blood-borne pathogens in the health care facility.

(2) Use protective barriers (mask, protective eyewear, face shields, gowns or aprons) when performing procedures that may produce blood or body fluids splashes when conditions permit
(3) Wash hands and skin surfaces immediately if contaminated with blood or body fluids.
(4) Take precautions to prevent injuries from needles, scalpels, and other sharp objects during use, clean up, or disposal(5) Used needles should NEVER be recapped!
(6) Health care workers with lesions or dermatitis should refrain from all direct patient care and from handling patient-care equipment until the condition resolves

Protective equipment

(1) Gloves
(2) Mask
(3) Protective eyewear, face shield
(4) Gowns or aprons.

TERMINAL LEARNING OBJECTIVE

Given a scenario, choose the appropriate patient management procedures associated with medical and surgical asepsis IAW cited references.

Infection

Process of Infection

(1) Involves three stages
- (a) Invasion
- (b) Localization/Containment
- (c) Resolution

(2) Infection may revert back or become worse at any stage of the process

(3) Identification of the infecting agent is essential so that specific antibiotic therapy may be initiated if appropriate

(4) Invasion - introduction of pathogenic microorganisms into the tissue
- (a) May be result of violating aseptic or sterile technique during wound preparation or medical procedure.
- (b) Poor skin/ wound preparation of a contaminated wound
- (c) Other routes

(5) Localization/Containment
- (a) The inflammatory response is the body's initial defense directed toward localization and containment of the infecting organism
  - (i) RBC'S, WBC'S, and Macrophages infiltrate the tissue with poss ble abscess formation
  - (ii) The body attempts to ward off the abscess by building a membrane encapsulating the tissue or cells

(6) Resolution
- (a) Depends on immunological responses capable of overcoming the infectious process
- (b) Associated with drainage and removal of foreign material, including debris of bacteria and cells, lysis (disintegration) of microorganisms, reabsorption of exudate, and sloughing of necrotic tissue

Classification of infection

(1) Infections are classified by source and etiology
- (a) Source
  - (i) Community acquired - natural disease process that develop or were incubating prior to admission to the hospital
  - (ii) Nosocomial - infection in hospitalized patients that were not present or incubating when the patient was admitted
- (b) Etiology
  - (i) Bacterial - caused by bacteria
  - (ii) Nonbacterial - All other causes such as viruses, fungi, athropod, etc.

Factors that influence wound healing

(1) General health
  (a) Diabetes, alcoholism, malignancy and other chronic conditions upset normal physiology, delaying wound healing and making the patient more susceptible to infection
  (b) Remote focus infections
  (c) Smoking contributes to respiratory complications and causes change in mucosa and decreases blood flow
(2) Age -- premature infants and geriatric patients are especially prone to infection due to deficient immune systems
(3) Nutritional status
  (a) Wound healing is impaired by deficiencies in proteins, carbohydrates, zinc, and vitamins A, B, and K
  (b) Body weight--loss greater than 10% and protein energy malnutrition, compromise wound healing and increase the risk of infection
  (c) Patients with extensive burns, and multiple injuries will have increased caloric requirements
(4) Obesity
  (a) Fat is the most vulnerable of all tissues to trauma and infection because of its poor vascularity
  (b) Patients with more than 100 bs over ideal body weight will have some degree of cardiac decompensation and respiratory insufficiency
(5) Fluid and electrolyte balance
  (a) Fever associated with infection will affect the bodies ability to maintain a normal balance
  (b) Fever can raise fluid requirements as much as 15% for each 1.5 degrees Fahrenheit of body temperature

Factors that contribute to infection -- Infection results from the interaction between three elements: organisms, tissues, and host defenses

(1) Organism - size and virulence have to do with the microbes ability to cause disease
(2) Tissue - the condition of the tissues is significant; necrotic, devitalized, avascular tissue or the presence of blood or foreign bodies provide an excellent media for pathogenic growth
(3) Host defense - the general health of the patient influences resistance to microbial invasion

Aseptic Technique

Contact contamination plays a major role in bacterial spread.

Barriers are established to control the spread of microorganisms by:

(1) Protecting sterile areas
(2) Isolating surgical wounds
(3) Keeping free microbes to a minimum

Types of barriers

(1) Skin
  (a) Washing with soap (antimicrobial) before and after patient contact
  (b) Donning surgical attire

  NOTE: It is important to note that under emergency surgical conditions, all steps necessary to maintain asepsis are taken.

  (c) Covering abrasions and cuts on hands with gloves
(2) Hair -- caps should be worn
(3) Mouth and nose
  (a) A mask should be worn
  (b) People with respiratory tract infections should not work with open wounds
  (c) Ta king should be kept to a minimum
(4) Fomites - nonliving material such as bed linen that may transmit microorganisms
  (a) Should be packaged and stored properly
  (b) Clean and soiled supplies should be physically separated
  (c) Prompt decontamination of used equipment and reusable supplies

Housekeeping

NOTE: Depending on the tactical or clinical environment, cleaning and disinfection should be according to local infection control policies.

(1) Surfaces should not remain wet
(2) Organic debris should be promptly removed and surfaces disinfected
(3) Housekeeping equipment should be kept clean and dry
(4) Appropriate waste receptacles should be used

Isolation precautions

(1) Purpose
  (a) To prevent transmission of pathogenic microorganisms from the patient, and personnel to the patient
  (b) Isolation techniques separate infected patients and noninfected susceptible patients
  (c) When employing isolation techniques, hand washing remains the most important control measure
(2) Methods of isolation
  (a) Category-specific isolation -- for patients with suspected or confirmed infectious disease transmitted by droplets via airborne route or enteric excretions, drainage, and secretions.
  (b) Disease-specific isolation -- precautions for contact with patients known to be infected with blood borne pathogen, such as HBV.

(c) Body-substance isolation (BSI)-- incorporating universal precautions for contact with all moist body substances, including blood, urine, feces, saliva, sputum, tears, wound drainage, etc., body substance isolation is interaction driven, rather than diagnosis driven.

NOTE: Hand washing cannot be overemphasized; this means vigorous scrubbing with lathered soap followed by rinsing under a stream of water.

Sterile Technique

NOTE: Aseptic techniques control microorganisms in the environment, sterile techniques prevent transfer of microorganisms into the body tissues.

Need for sterile technique

(1) Freshly incised or traumatized tissue is easily infected
(2) Intact skin is the body's first line of defense against infection
(3) Any break in the integrity of the skin is a potential route of entry for infection
(4) Items coming into contact with the skin or mucous membrane are a potential hazard
  (a) Critical -- items entering the body tissues underlying skin and mucous membrane must be sterile; they are handled to maintain sterility.
  (b) Semicritical -- sterility is less critical for items used on intact skin and mucous membrane, these items may have been cleaned, disinfected, or even sterilized prior to use, but sterility is not maintained.
  (c) Noncritical -- sterility is not maintained on these items, they will be used on intact skin and mucous membrane only. These items will be terminally cleaned and shelved until the next use.

Principles of sterile technique

(1) The patient is the center of the sterile field. This includes the surface the patient is lying on, furniture, and properly attired personnel.
(2) Sterile staff have scrubbed, gowned, and gloved
(3) Only sterile items may be used within the sterile field
  (a) Items may be obtained commercially sterilized, or be locally sterilized by CMS
  (b) Each person that dispenses a sterile item must be sure of its sterility and protect its sterility until it is used

NOTE: If you have a question about the sterility of an item, consider it unsterile! When in doubt, throw it out!

(4) Gowns are considered sterile only from the waist to the shoulder-level in the front, and the sleeves
(5) Sterile people keep their hands in sight and above waist level
(6) Hands are kept away from the face, elbows are kept at the sides
(7) Items dropped below waist level will be considered unsterile

(8) Tables are considered sterile at table level only
  (a) Only the top of a sterile draped table is considered sterile (edges and sides are not)
  (b) Anything falling or extending over the edge of the table is considered unsterile
  (c) Outer 1 inch edge of table top is considered unsterile
(9) Only persons that are sterile touch sterile items
(10) Unsterile persons do not reach over a sterile field; sterile persons avoid leaning over a sterile field.
(11) The sterile field is created as close as poss ble to the time of use. The degree of contamination is proportional to the time the sterile items are exposed to the environment.
(12) Sterile areas are continuously kept in view. Avoid turning your back to a sterile field, or walking between two sterile fields.
(13) Integrity of the sterile package is destroyed if it is perforated, punctured, or contaminated with moisture
(14) Microorganisms must be kept to an irreducible minimum
  (a) Skin cannot be sterilized and is a potential source of contamination. Scrubbing, gowning, and gloving reduce the possibility of contamination to a minimum.
  (b) Where some areas cannot be scrubbed (i.e., mouth, nose, throat), masking reduces the risk of contamination
  (c) Air is contaminated by dust and droplets. Environmental control measures must be employed to control this source of contamination.

TERMINAL LEARNING OBJECTIVE

Given a fully stock CMVS or M5 Bag, initiate an intravenous infusion (IV) IAW cited references.

Identify indications for administering an Intravenous (IV) infusion

Dehydration - when oral replacement is inadequate or impossible
To replace blood and blood products
To maintain or replace electrolytes
Administer medications and dilute poisons in the blood
To provide a source of nutrients
To administer water-soluble vitamins

Identify commonly used IV solutions

Fluid replacement

(1) Whole blood
(2) Packed red blood cells
(3) Fresh frozen plasma
(4) Colloids - contain protein or other high molecular weight molecules
  (a) Plasma Protein Fraction
  (b) Salt-poor albumin
  (c) Dextran
  (d) Hetastarch
(5) Crystalloids
  (a) Isotonic solutions - Will not cause a significant fluid or electrolyte shift
  (b) Hypertonic solutions
    (i) Higher solute concentration
    (ii) Tend to cause fluid shift out of intracellular compartment into extracellular compartment
  (c) Hypotonic solutions
    (i) Less solute concentration when compared to plasma
    (ii) Tend to cause movement from extracellular compartment into the intracellular compartment

Commonly used intravenous solutions

(1) Normal saline solution (NS, 0.9% NaCl)
  (a) Description
    (i) Isotonic solution (contains same amounts of sodium and chloride found in plasma)
    (ii) Contains 90 grams of sodium chloride per 100 ml of water
  (b) Indications
    (i) Solution of choice to be used in conjunction with a blood transfusion
    (ii) Indicated for restoring the loss of body fluids
(2) Ringer's Solution or Lactated Ringer's (LR)
  (a) Description

(i) Isotonic solution (replaces electrolytes in amounts similarly found in plasma)
(ii) Contains sodium chloride, potassium chloride, calcium chloride, and sodium lactate.

(b) Indications
(i) Solution of choice for burns
(ii) Most cases of dehydration
(iii) Supportive treatment of trauma

(3) Five percent dextrose and water (D5W)

(a) Description
(i) Isotonic solution (the glucose is metabolized quickly, leaving a solution of dilute water)
(ii) Contains 5 grams of dextrose per 100 ml of water

(c) Indications
(i) Provide a source of calorie replacement
(ii) Solution of choice when glucose is needed for metabolism (hypoglycemia)

Identify common complications of IV therapy

Infiltration - Accumulation of fluid in the tissue surrounding an IV needle site

(1) Cause - penetration of the vein wall by the needle/catheter or later dislodgment

(2) Signs and symptoms
(a) Flow rate may or may not be slow or no flow of solution
(b) Infusion site is cool and hard to the touch
(c) Infusion site or extremity is pale and swollen
(d) Patient complaints of pain, tenderness, burning, or irritation at infusion site
(e) Fluid leaking around infusion site

(3) Corrective action
(a) Stop IV infusion immediately and remove needle or catheter
(b) Elevate extremity with IV
(c) If noticed within 30 minutes of onset, apply ice to swelling
(d) If noted later than 30 minutes of onset, apply warm compresses to encourage absorption
(e) Notify supervisor of infiltration
(f) Document observations and actions
(g) Restart IV in another location, if directed

(4) Preventive measures
(a) Tape catheter hub and tubing securely to limb
(b) Stabilize extremity in use by applying arm board if necessary

Phlebitis - Inflammation of the wall of the vein

(1) Causes
(a) Injury to the vein during puncture

(b) From later needle movement
(c) Irritation to vein as result of
(i) Long-term therapy (vein overuse)
(ii) Irritating or incompatible additive
(iii) Using large-bore catheters
(iv) Using lower extremities as IV sites
(v) Infection

(2) Signs and symptoms
(a) Sluggish flow rate
(b) Swelling around the infusion site
(c) Patient complaints of pain and tenderness
(d) Redness and warmth along the vein

(3) Corrective action
(a) Stop IV infusion immediately
(b) Report observations to supervisor
(c) Treat affected limb like an infiltration
(d) Document observations/actions

(4) Preventive measures
(a) Keep infusion flowing at prescribed rate
(b) Select large vein when irritating drugs/fluids are given
(c) Change tubing every 24 to 48 hours or IAW local SOP
(d) Change solutions and dressings every 24 to 48 hours or IAW local SOP
(e) Change IV site PRN or IAW local SOP

Air embolism - The obstruction of a blood vessel (usually occurring in the lungs or heart) by air carried via the bloodstream

WARNING: The minimum quantity of air that may be fatal to humans is not known. Animal experimentation indicates that fatal volumes of air are much larger than the quantity present in the entire length of IV tubing. Average IV tubing holds about 5 ml of air, an amount not ordinarily considered dangerous.

(1) Causes
(a) Failure to remove air from the tubing
(b) Allowing the solution to run dry
(c) Disconnected IV tubing

(2) Signs and symptoms
(a) Abrupt drop in blood pressure
(b) Weak, rapid pulse
(c) Cyanosis
(d) Chest pain

(3) Corrective action
(a) Notify supervisor and physician immediately
(b) Immediately place patient on left side with feet elevated to allow the pulmonary artery to absorb small air bubbles
(c) Administer oxygen as needed

(4) Preventive measures
(a) Clear all air from tubing before attaching it to the patient

(b) Monitor solution levels closely and change before they are empty
(c) Check to see that all connections are secure

Circulatory overload - an increased blood volume resulting from excessive IV fluid being infused too rapidly into the vein

CAUTION: Use extreme caution when administering IV fluid to pediatric or geriatric patients and to patients experiencing CHF, pulmonary edema or head trauma. All of these types of patients are at increased risk of circulatory overload.

(1) Causes
  (a) Fluid delivered too fast
  (b) Reduced kidney function
  (c) Congestive heart failure or cardiac insufficiency
(2) Signs and symptoms
  (a) Elevated blood pressure
  (b) Distended neck veins
  (c) Rapid breathing, shortness of breath, tachycardia
  (d) Fluid intake is much greater than urinary output
(3) Corrective action
  (a) Decrease flow rate to keep vein open (TKO)
  (b) Place the patient in the semi-Fowler's position to facilitate breathing
  (c) Notify supervisor immediately
  (d) Record observations and actions taken
(4) Preventive measures - frequently check flow rate to maintain desired rate

Infection
(1) Causes
  (a) Use of contaminated equipment
  (b) Poor aseptic venipuncture technique
  (c) Contaminated site or IV equipment not changed regularly
(2) Signs and symptoms
  (a) Redness, swelling, and soreness around IV site
  (b) Sudden rise in temperature and pulse
  (c) Drainage from IV site
(3) Corrective action
  (a) Notify supervisor immediately
  (b) Discontinue IV by removing the catheter tip and take a culture of wound to identify pathogens present
  (c) Use strict aseptic technique when cleaning and dressing the wound

CAUTION: If a culture of the site is ordered, it must be done before cleaning the site.

  (d) Document all corrective actions taken

(4) Preventive measures
  (a) Use complete aseptic technique when starting an IV
  (b) Clean site thoroughly when IV is initiated and then periodically IAW local SOP to prevent infection
  (c) Anchor catheter and tubing securely
  (d) Check site at least daily for signs of inflammation IAW local SOP

Initiate an IV

Complete the following steps, in sequence, to initiate an IV

(1) Obtain a physician's order. May be standing order if in combat unit.
(2) Perform a patient care hand wash
(3) Gather equipment
  (a) Correct IV solution and amount (bag or bottle)
  (b) IV administration set and needle or catheter
    (i) Size of the catheter or needle varies from a 28 g to a 14 g
    (ii) Size will depend on the size of the vein or the amount and rate of fluid administration, the viscosity (thickness) of the solution to be administered, and the size and condition of the patient. (e.g., administration of blood requires a large bore catheter, 18 g or larger due to the thickness of blood)
  (c) Tape, constricting band, sterile gauze, antiseptic sponges (Betadine is commonly used for cleaning the skin)
  (d) Latex gloves
(4) Identify patient and explain the procedure (ask about known allergies such as betadine, alcohol, medications, ask if they have had an IV before)
(5) Inspect and assemble equipment
  (a) IV bag - Expiration date, clarity, leaks

CAUTION: Any doubt regarding clarity, leaks, defect or contamination of any equipment or supplies, check with supervisor prior to starting the IV.

  (b) Packages (gloves, gauze) - tears or rips, water marks
  (c) Tubing - remove infusion set from box. Inspect for any holes, cracks or other signs of defects and tighten the clamp 6 to 8 inches below the drip chamber.
  (d) Remove protective covers from the spike of the drip chamber and from the outlet (long spout) of the IV container without contaminating them.
  (e) Needle or catheter - inspect for barbs or nicks and discard in sharps container if flawed
  (f) Insert the spike into the container
    (i) If using a bag, push the spike firmly into the container's outlet tube
    (ii) If using a bottle, push the spike firmly through the container's diaphragm

(6) Hang the container at least 2 feet above the level of the patient's heart if possible and squeeze the drip chamber until it is half full of solution.

(7) Remove air from tubing as follows
- (a) Hold end of tubing above the level of the bottom of the IV container
- (b) Loosen protective cover on needle adapter to allow air to escape
- (c) Release the clamp on tubing
- (d) Gradually lower the tubing until the solution reaches the end of the needle adapter

CAUTION: If small air bubbles remain in tubing, tap tubing with finger from bottom to top allowing air bubbles to rise.

- (e) Clamp the tubing
- (f) Retighten protective cover
- (g) Loop tubing over IV stand

(8) Cut several strips of tape and hang them in a readily accessible location

(9) Select the infusion site
- (a) Choose the most distal and accessible vein of an uninjured arm or hand
- (b) Avoid veins that are infected or injured and irritated areas

WARNING: Use lower extremities only if there is no accessible site in upper extremity.

- (c) Avoid sites over joints because the catheter is difficult to stabilize. Dislodgment and infiltration can occur and flow may increase or decrease with joint movement.
- (d) Use the nondominant hand or arm, whenever possible
- (e) Select a vein large enough to accommodate the size of needle/catheter to be used

(10) Prepare infusion site
- (a) Apply constricting band about 2 inches above venipuncture site, tight enough to stop venous flow but not so tight that the radial pulse cannot be felt.

CAUTION: Do not leave the constricting band in place for more than 2 minutes.

- (b) Instruct patient to open and close his/her fist several times to increase circulation
- (c) Select and palpate a prominent vein
- (d) Clean skin with antiseptic sponge in a circular motion from the center outward
- (e) Inspect IV catheter and loosen catheter/needle by rotating catheter

CAUTION: If patient is allergic to betadine, use only the alcohol pad.

(11) Put on gloves for self-protection against transmission of contaminants
(12) Hold the catheter with your dominant hand and remove protective cover without contaminating the needle
(13) Hold flash chamber with thumb and forefinger directly above the vein or slightly to one side of the vein
(14) Draw the skin below the cleaned area downward to hold the skin taut over the site of venipuncture
(15) Position the needlepoint, bevel-up, parallel to the vein and about 2 inch below the site of venipuncture
(16) Hold the needle at approximately a 20-30 degree angle and pierce skin

CAUTION: Ensure that thumb-holding skin taut does not contaminate catheter/needle or recontaminate cleansed skin area.

(17) Decrease the angle until almost parallel to skin surface and direct it toward the vein. Continue advancing the needle/catheter until the vein wall is pierced.

CAUTION: A faint "give" will be felt as the vein wall is pierced.

(18) Check for blood in the flash chamber
  (a) If blood is not noted in the flash chamber, pull needle back slightly (but not above skin surface) and attempt to redirect the needlepoint into the vein.
  (b) If still unsuccessful, release the constricting band, withdraw catheter/needle, and use the alcohol swab or a small sterile gauze to put pressure on the site.
  (c) Notify your supervisor before attempting a venipuncture at another site

CAUTION: If constricting band is not released, patient will bleed excessively when needle is removed.

(19) Advance catheter/needle units approximately 1/8 inch further to ensure placement of catheter is into the vein
(20) Stabilize flash chamber with dominant hand, grasp catheter hub with nondominant hand and thread catheter into vein, to catheter hub

CAUTION: Pressing lightly on skin over catheter tip is necessary to decrease or stop blood flow from catheter hub after needle is removed.

(21) Remove flash chamber/needle and lay aside (dispose of needle properly after IV site has been secured)

CAUTION: After removal of stylet needle - Never reinsert stylet needle into catheter; a portion of the catheter sheath could be sheared off causing an embolus.

(22) With dominant hand, remove the protective cover from needle adapter on tubing and quickly connect adapter into the catheter hub, while maintaining stabilization of the hub with nondominant hand.
(23) Tell the patient to unclench the fist and then release the constricting band
(24) Unclamp IV tubing and adjust flow rate to appropriate drip rate (TKO or per doctor's orders)
  (a) TKO or KVO means to keep vein open
  (b) Maintained at a flow rate of 30 ml's per hour or about 7-10 drops per minute
(25) Examine infusion site for infiltration and discontinue if infiltration is present
(26) Clean the area of blood if necessary and secure hub of catheter with tape, leaving hub and tubing connection vis ble

CAUTION: Do not release hold on catheter hub/catheter connection until secured with at least one piece of tape.

(27) Apply a sterile dressing over the puncture site or IAW local SOP
(28) Loop the IV tubing on extremity and secure with tape
(29) Splint the arm loosely on a padded splint, if necessary, to reduce movement
(30) Print the date, gauge of the catheter, time the IV was started and initials of the person initiating the IV on a piece of tape. Secure the tape to the dressing.
(31) Print patient's identification, drip rate, date, time the IV infusion was initiated and initials of the person initiating the IV on a piece of tape. Secure the tape to the IV container.
(32) Print the date and time the tubing was put in place and the initials of the person initiating the IV on a piece of tape and wrap the tape around the tubing, leaving a tab.
(33) Re-examine site for infiltration
(34) Remove gloves and perform a patient care hand wash
(35) Record the procedure on the appropriate form

Identify alternate administration sites

Femoral veins

(1) Indication - no suitable peripheral veins can be accessed
(2) Site
  (a) Medially adjacent to pulsation of femoral artery
  (b) Find midpoint of line drawn between the symphysis pubis and superior iliac crest
(3) Complications
  (a) Hematoma from vein or adjacent femoral artery
  (b) Thrombosis

(c) Phlebitis
(d) Thrombosis or phlebitis may extend to iliac veins or inferior vena cava

Intraosseous infusion

(1) Indications
  (a) The pediatric or adult patient who is in cardiac arrest and in whom you cannot quickly obtain peripheral venous access
  (b) Hypovolemic pediatric patient who faces a prolonged transport time and in whom you cannot quickly and easily start a peripheral IV
(2) Site - proximal tibia, one fingerbreadth below the tibial tuberosity either midline or slightly medial to the midline
(3) Steps in the procedure
  (a) Prep the skin with betadine (very important)
  (b) Prepare bone marrow needle or 16 gauge spinal needle for proper depth during insertion. Insert needle pointing away from epiphyseal plate, advancing to periosteum
  (c) Use a screwing motion to penetrate the bone until decreased resistance is felt (see diagram 5)
  (d) Once you have penetrated the bone and decreased resistance in the bone marrow cavity
  (e) Remove the stylet (see diagram 6 and 7)
  (f) Aspirate bone marrow into a saline filled syringe. (Bone marrow may not always be aspirated)
  (g) Infuse saline by syringe to ensure placement and to remove clots
  (h) Secure needle with tape, although the needle is usually well stabilized by bone
  (i) Attach standard IV tubing and fluids to infuse under gravity or pressure as prescribed by medical control
(4) Complications
  (a) Epiphyseal plate injury
  (b) Osteomyelitis
  (c) Sepsis
  (d) Tibial fracture if needle too large
  (e) Marrow damage
  (f) Fat embolism

Manage an IV

Replace the solution container (only). Every 24 hours when running a slow infusion.

CAUTION: Do not allow solution container to run completely out before changing containers.

(1) Perform a patient care hand wash

(2) Select or prepare the new solution container by removing the protective cover from the outlet tube
(3) Clamp IV tubing shut
(4) Remove the used container from the IV hanger, and remove the sp ke from it

CAUTION: The old tubing is connected to the catheter. Care must be taken to maintain sterility. To prevent the back flow of blood, keep the sp ke and tubing elevated.

(5) Insert the IV spike into new IV container
(6) Hang the new container
(7) Adjust the infusion rate
(8) Label the solution container and prepare a timing label
(9) Record the amount of solution received from the previous container, and time, type, and amount of new solution.

Change the dressings every 24 hours or IAW local SOP

(1) Perform patient care hand wash and don gloves
(2) Remove the tape and the old dressing without dislodging the catheter

NOTE: Tubing should remain taped in place to reduce the chance of accidental dislodgment of the catheter.

(3) Clean the area around the infusion site IAW local SOP
(4) Examine the site for signs and symptoms of infiltration
(5) Cover the infusion site with sterile gauze and secure with tape, or dress IAW local SOP
(6) Secure the dressing to the site without encircling the wrist or arm
(7) Label the dressing

Replace the solution container and tubing every 48 hours or IAW local SOP

CAUTION: Changing the tubing should coincide with the time the solution container will be changed.

(1) Perform patient care hand wash
(2) Spike the new tubing into a new solution container and hang it from the IV pole
(3) Prime the tubing and clamp it
(4) Clamp old tubing shut
(5) Connect the new tubing to the catheter hub

WARNING: Wear gloves for self-protection and to protect the patient against transmission of contaminants whenever handling body fluids.

(a) Loosen the tape on the old tubing without dislodging the catheter

(b) Place sterile gauze pad under the catheter hub to provide a small sterile field for the catheter hub
(c) Grasp new tubing between the fingers of one hand
(d) Grasp catheter hub with a sterile gauze pad and carefully disconnect the old adapter. (Press fingers over catheter tip to help prevent back flow of blood).
(e) Remove the protective cap from the new tubing adapter and quickly connect it to the catheter hub

CAUTION: Do NOT remove the protective cap with your teeth.

(f) Remove the gauze pad from under the catheter hub and clean the site, if necessary
(g) Secure the tubing to the arm and reinforce the dressing as necessary
(h) Adjust the infusion rate

NOTE: If replacing catheter, discontinue IV, select new IV site proximal to old IV site (if using same limb), and start new IV.

Discontinue (DC) and IV

Perform patient care handwash
Put on exam gloves
Clamp the IV tubing
Remove the tape and dressing without dislodging the catheter
Place a sterile gauze pad over the injection site
Smoothly pull out the catheter, following the course of the vein

WARNING: Do not twist, raise, or lower the catheter.

Apply pressure to the site with the gauze
Examine the catheter to ensure that it was removed intact
Apply an adhesive bandage to the site, if necessary
Dispose of used equipment IAW local SOP
Record the procedure on the appropriate form

Perform a Patient Care Handwash & Put On and Remove Sterile Glvoes
Appendix A
Competency Skill Sheets

Patient Handwash

Soldiers Name: _____SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Removed jewelry.	P / F	P / F	P / F
b.	Stood in front of sink without leaning against it. Turned on water and adjusted temperature.	P / F	P / F	P / F
c.	Washed hands. (1) Thoroughly wet hands and forearms under running water. (2) Applied soap using circular motions. (3) Washed hands, wrists, and lower forearms, using a circular scrubbing motion. Interlaced fingers and rubbed hands back and forth. (4) Verbalized handwash should be a minimum of 10-15 seconds. (5) Inserted fingernails from one hand under those of the other hand using a sweeping motion. Repeated with the other hand.	P / F	P / F	P / F
d.	Rinsed hands, wrists and forearms (1) Did not touch any part of the contaminated sink or faucet. (2) Rinsed thoroughly with hands and wrists lower than elbow so water runs from forearm towards fingers.	P / F	P / F	P / F
e.	Dried hands, wrists and forearms with clean paper towel. Dried from fingertips to e bows without retracing steps. Repeated process on other arm using another towel.	P / F	P / F	P / F
f.	Used a clean towel to turn off water faucet.	P / F	P / F	P / F
g.	Disposed of towel directly after use.	P / F	P / F	P / F

Instructor Comments:

Put On and Remove Sterile Gloves

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

Donning Sterile Gloves

		1st	2nd	3rd
a.	Selected proper size package of sterile gloves.	P / F	P / F	P / F
b.	Inspected package for contamination.	P / F	P / F	P / F
c.	Performed a patient care handwash.	P / F	P / F	P / F
d.	Opened the sterile package. Placed package on flat, clean, dry surface. Peeled outer wrapper open to completely expose the inner package.	P / F	P / F	P / F
e.	Removed the inner package by touching only the folded side of the wrapper. Positioned the inner package with the cuff end next to student.	P / F	P / F	P / F
f.	Unfolded the inner package by grasping the lower corner of the package and opening the package to a fully flat position without touching the gloves.	P / F	P / F	P / F
g.	Exposed both gloves by grasping lower corners of the folder and pulled gently to the side without touching the gloves.	P / F	P / F	P / F
h.	Put on first glove. (1) Grasped cuff at folded edge and removed it from the wrapper with one hand. (2) Stepped away from the table. (3) Kept hands above the waist, inserted fingers of other hand into the glove. (4) Pulled on the glove touching only the exposed inner surface of the glove.	P / F	P / F	P / F
i.	Put on second glove. (1) Inserted fingertips of the gloved hand under the edge of the folded cuff. (2) Kept hands above the waist, inserted fingers of ungloved hand into the glove. (3) Pulled glove on. (4) Did not contaminate either glove.	P / F	P / F	P / F
j.	Adjusted gloves to fit properly. (1) Grasped and picked up glove surfaces to adjust them. (2) Picked up palm surfaces and worked the fingers and hands into the gloves. (3) Interlocked the gloved fingers and works the gloves hands until the gloves are firmly on the fingers.	P / F	P / F	P / F

Removal of Sterile Gloves

a.	Grasped one glove at the heel of the hand with the other gloved hand.	P / F		
b.	Peeled off glove, retaining it in the palm of the gloved hand.	P / F		
c.	Reached under the cuff of the remaining glove with one or two fingers of the ungloved hand.	P / F		
d.	Peeled off glove over the glove being held in the palm.	P / F		
e.	Did not contaminate himself.	P / F		
f.	Discarded the gloves.	P / F		
g.	Performed a patient care handwash.	P / F		

Instructor Comments:

Initiate and Manage a Patient with an Intravenous Infusion
Appendix B
Competency Skill Sheets

IV Infusion

Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Obtained a physician's order.	P / F	P / F	P / F
b.	Performed a patient care handwash.	P / F	P / F	P / F
c.	Gathered equipment.	P / F	P / F	P / F
d.	Identified patient and explained procedure. Asked about allergies.	P / F	P / F	P / F
e.	Inspected and assembled equipment.	P / F	P / F	P / F
f.	Hung container at least 2 feet above the level of the patient's heart and squeezed the drip chamber until it is half full of solution.	P / F	P / F	P / F
g.	Removed air from the tubing.	P / F	P / F	P / F
h.	Cut several tape strips and hung them in accessible location.	P / F	P / F	P / F
i.	Selected infusion site.	P / F	P / F	P / F
j.	Prepared the infusion site. (1) Applied constricting band 2" above venipuncture site - tight enough to stop venous flow, but not so tight that radial pulse cannot be felt. (2) Instructed patient to open and close first several times to increase circulation. (3) Selected and palpates a prominent vein. (4) Cleaned skin with antiseptic sponge in a circular motion from the center outward.	P / F	P / F	P / F
k.	Put on gloves.	P / F	P / F	P / F
l.	Held catheter with dominant hand and removed protective cover without contaminating needle.	P / F	P / F	P / F
m.	Held flash chamber with thumb and forefinger directly above the vein or slightly to the side of the vein.	P / F	P / F	P / F
n.	Drew skin below cleansed area downward to hold the skin taut over the site of the venipuncture.	P / F	P / F	P / F
o.	Positioned the needle point, bevel up, parallel the vein and about 1/2 inch below the venipuncture site.	P / F	P / F	P / F
p.	Held the needle at approximately 20-30 degree angle and pierced skin.	P / F	P / F	P / F
q.	Decreased angle until almost parallel to skin	P / F	P / F	P / F

	surface and direct it toward the vein. Continued advancing the needle/catheter until vein is pierced.			
r.	Checked for blood in the flash chamber.	P / F	P / F	P / F
s.	Advanced catheter/needle unit approximately 1/8 inch further to insure catheter placement in the vein.	P / F	P / F	P / F
t.	Stabilized flash chamber with dominant hand, grasped catheter hub with non-dominant hand and treaded catheter into vein to catheter hub.	P / F	P / F	P / F
u.	Removed flash chamber/needle and laid aside.	P / F	P / F	P / F
v.	With dominant hand, removed protective cover from needle adapter on tubing and quickly connected adapter into the catheter hub, while maintaining stabilization of the hub with non-dominant hand.	P / F	P / F	P / F
w.	Told patient to unclench fist and released constricting band.	P / F	P / F	P / F
x.	Unclamped IV tubing and adjusted flow rate to appropriate drip rate.	P / F	P / F	P / F
y.	Examined infusion site for infiltration and discontinued if infiltration is present.	P / F	P / F	P / F
z.	Cleaned the area of blood, if necessary, and secured hub of catheter with tape, leaving hub and tubing connection visible.	P / F	P / F	P / F
aa.	Applied a sterile dressing over the puncture site.	P / F	P / F	P / F
bb.	Looped the IV tubing in extremity and secured with tape.	P / F	P / F	P / F
cc.	Splinted the arm loosely on a padded splint, if necessary, to reduce movement.	P / F	P / F	P / F
dd.	Printed the date, gauge of the catheter, and time IV was started and initials of person starting IV on a piece of tape and secured the tape to the dressing.	P / F	P / F	P / F
ee.	Printed patient's identification, drip rate, date and time the IV infusion was initiated and the person initiating the IV on a piece of tape and secured the tape to the IV container.	P / F	P / F	P / F
ff.	Printed the date and time the tubing was put in place and the initials of the person initiating the IV on a piece of tape and wrapped the tape around the tubing, leaving a tab.	P / F	P / F	P / F
gg.	Re-examined the IV site for infiltration.	P / F	P / F	P / F
hh.	Removed gloves and performed a patient care handwash.	P / F	P / F	P / F
ii.	Recorded the procedure on the appropriate form.	P / F	P / F	P / F

Instructor Comments:

91W10
Advanced Individual Training Course

Nuclear, Biological, and Chemical Handbook

Department of the Army
Academy of Health Sciences
Fort Sam Houston, Texas 78234

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TERMINAL LEARNING OBJECTIVE

Given a potential or simulated chemical or biologically contaminated environment.

Individual protection equipment

All soldiers are issued standard "A" chemical defense equipment. This includes a protective mask, battle dress overgarment, chemical protective glove, and chemical protective overboots

CAUTION: Wearing the BDO adds 10-15 degrees F to the body's ambient temperature; therefore, soldiers must maintain an adequate fluid intake both before and during the time of wear. Additional caution must be taken in warmer climates due to the increased risk of heat related injuries.

Battle dress overgarment (BDO)

(1) Characteristics
- (a) Consists of a pair of trousers and a jacket with a charcoal liner
- (b) The outer cloth is specially treated with "scotch-guard" type treatment, to resist liquid chemical agents
- (c) The BDO adds approximately 11 pounds to the weight already carried by the soldier

(2) Wear time
- (a) Uncontaminated environment - minimum of 30 days. The unit commander may extend the wear past the 30 days
- (b) Contaminated environment - 24 hours

Chemical boots

(1) Characteristics - green vinyl over boot (GVO)/Black vinyl overboot (BVO). Worn over combat boots to protect feet from contamination by all known agents, vectors and radiological particles

(2) Wear time
- (a) Uncontaminated environment - 14 days, inspected for serviceability and worn 14 days more if found serviceable
- (b) Contaminated environment - 24 hours, inspected and decontaminated and worn 24 hours more if found serviceable

Protective mask - M40A1

(1) Characteristics
- (a) The M40A1 is designed to protect the wearer from all known chemical and biological agents and riot control agents. When worn correctly, the mask will provide protection for the face, eyes, and respiratory tract
- (b) The mask uses a NATO standard external filter canister that may be positioned on the soldier's right or left cheek to allow him to fire the M16A2 rifle. The filter cannot be exchanged in a contaminated environment
- (c) The only optical insert approved for use in the M40 mask is a wire-frame type

(d) A drinking tube positioned around the outlet valve assembly, allows soldiers to drink from their canteen with an M-1 cap, while in a chemical environment

CAUTION: Both the canteen and coupling half must be checked with M8 paper to ensure they are not contaminated prior to drinking.

(2) Wear time - while in the theater of operations, filters must be replaced at least every 30 days
(3) The filters must be replaced whenever any of the following occurs
  (a) The elements are immersed in water
  (b) The elements are crushed, cut, or damaged
  (c) Excessive breathing resistance is encountered
  (d) After exposure to hydrogen cyanide
  (e) After 30 days in a theater of operations
  (f) When ordered by the unit commander
(4) Protective masks designed for use in tanks, combat vehicles and aircraft are issued as required
(5) The small M17A1 protective mask will only be assigned to soldiers who cannot be correctly fitted with a small M40 mask

Chemical protective gloves

(1) Characteristics
  (a) Butyl rubber with an inner glove made of thin white cotton
  (b) No protection against cold weather injuries
  (c) There are 3 types of gloves
    (i) .025 inch thick - used by soldiers who perform combat tasks
    (ii) .014 inch thick - used by aviators and vehicle mechanics
    (iii) .007 inch thick - used by medical personnel. Allow excellent tactile ability
(2) Wear time
  (a) Uncontaminated environment - can be worn as long as they remain serviceable
  (b) Contaminated environment - wear 24 hours, inspect; if serviceable, decontaminate; reuse. May repeat process every 24 hours
  (c) The .007 inch gloves must be inspected and decontaminated within 6 hours. After inspection, if found serviceable they may be reused

Individual decontamination equipment

M291 skin decontamination kit - is the standard ARMY decon kit
(1) Purpose - to decontaminate the skin
(2) Characteristics
  (a) Each kit contains six applicator packets that utilize a mixture of activated charcoal to absorb and neutralize liquid chemicals on the skin

(b) While decontaminating oneself, a black resin powder is left on the skin to provide visual confirmation of the thoroughness of the application
(c) The resin does not irritate the skin, but use precautions to keep the powder away from wounds, the eyes and the mouth

M295 individual equipment decontamination kit
(1) Purpose - to decontaminate personal equipment
(2) Characteristics
(a) Each kit contains four packets, with one mitt each, that are utilized to remove chemical agents from personal equipment (e.g., M16A2, Kevlar helmet, LBE and M40 mask)
(b) Each mitt contains the same substance found in the M291
(c) Two packets are normally required to completely decontaminate all of a soldier's personal equipment

Patient protective equipment

Patient protective wrap (PPW)
(1) Purpose - to protective the patient during evacuation after the BDO has been removed and the patient has received medical treatment
(2) Characteristics
(a) Designed as onetime use for only one patient
(b) The protective mask is not needed while the patient is in the PPW, but should be evacuated with the patient
(c) A patient can remain in the PPW for up to six hours
(d) Has one continuous zipper around the outer edge for ease of patient insertion
(e) An impermeable, transparent window is located at the head of the wrap for patient observation. Two protected sleeves next to the window permit the passage of IV tubing
(f) A transparent pocket below the window holds the field medical card
(g) Can be carried either by the handles on the side or by inserting poles into the side sleeves

Decontaminable litter - utilized as a replacement for the canvas litter during patient decontamination procedures. The fabric cover is not degraded by decontamination fluids

Detection equipment and alarms

M8 chemical agent detector paper
(1) Purpose - to detect both the presence and specific type of liquid chemical agent
(2) Characteristics
(a) Each soldier carries one booklet of M8 paper in the interior pocket of the protective mask carrier
(b) To use the M8 paper, one-half sheet is blotted onto an unknown liquid. After waiting for 30 seconds, the color change is compared to the colors inside the front cover of the booklet. The colors are as follows

(i) Yellow - G (nerve)
(ii) Red - H (blister)
(iii) Olive green or black - V (nerve)

CAUTION: False positive may be seen if the M8 paper is exposed to liquid insecticide, antifreeze or petroleum products.

M9 chemical agent detector paper

(1) Purpose - to detect the presence of a liquid chemical agent
(2) Characteristics
  (a) Each soldier carries one thirty-foot long by two-inch wide roll of M9 paper
  (b) Procedure for use
    (i) While wearing gloves, one strip is wrapped around the upper arm, the opposite wrists and ankle of the same side as the upper arm, creating a V-shape

WARNING: M9 paper is carcinogenic; therefore, it should not be allowed to come into direct contact with the skin.

(ii) Once the M9 paper comes in contact with a liquid agent, it turns a reddish or pinkish color
(iii) After seeing the color change, the soldier must immediately mask, alert others and, if warranted, proceed with skin decontamination

CAUTION: False positive may be seen if the M9 paper is exposed to liquid insecticide, antifreeze or petroleum products.

M256AI chemical agent detector kit

(1) Purpose
  (a) To detect and identify chemical agents (blood, blister, and nerve) present in either liquid or vapor form
  (b) Also used after a chemical attack to determine if it is safe to unmask
(2) Characteristics
  (a) The M256AI kit consists of the following items
    (i) One booklet of M8 paper, which detects chemical agents in liquid form
    (ii) Twelve detector tickets, which detect chemical agents in vapor form
    (iii) One set of instruction cards
  (b) A complete test using both the M8 paper and the detector ticket takes approximately 20 minutes to perform
  (c) The actual detector tickets for the M256A1 are carcinogenic; therefore, trainer tickets are provided for practical exercises

Chemical agent monitor (CAM)

(1) Purpose - to detect nerve and blister agents in vapor form only

(2) Characteristics
- (a) Operates in two modes, one for nerve, the other for blister
- (b) The intensity of the vapor is displayed as a bar code on the front of the cam

The M8A1 chemical agent alarm

(1) Purpose - to sample the air for the presence of NERVE AGENTS VAPORS ONLY.

(2) Characteristics
- (a) The M8A1 is the only remote continuous air sampling alarm that the U.S. Army currently possesses
- (b) The M8A1 can be located within a hospital complex, with alarm units placed to cover all critical care, treatment and support areas
- (c) The M8A1 has two components
  - (i) M43A1 detector
    - * The M43A1 is the portion that actually detects the vapor agent
    - * One M43A1 can have as many as five M42 alarms attached
  - (ii) M42 alarm
    - * Connected by WD-1 telephone wire to the M43A1 detector unit
    - * The alarm can be set to give an audible, visual, or the combination as a signal

TERMINAL LEARNING OBJECTIVES

Given a standard fully stocked Combat Medic Vest System (CMVS) or fully stocked M5 Bag, oxygen administration equipment (if available). You encounter a casualty with symptoms consistent with chemical agent exposure. All other life threatening injuries have been treated.

Classification and Properties of Vesicants

Classifications

(1) Sulfur mustard (HD)
(2) Lewisite (L)
(3) Phosgene oxime (CX)
(4) Hydrogen Cyanide

Properties

(1) Vesicants as a group are often referred to as "blister agents" due to the fact that blisters often form at the site of exposure
(2) Severity of vesicant damage is affected by the environmental conditions at the time of exposure
  (a) Warm, humid conditions will increase the severity of vesicant damage and shorten the time for symptom onset
  (b) Cold weather can retard the time of symptom onset, and if the exposed skin remains cold, it can lessen the severity of vesicant damage

Effects and Treatments for Sulfur Mustard Agent Exposure

Effects

(1) Mild exposure
  (a) Skin
    (i) Erythema - resembles a sunburn
    (ii) Blisters (later)
    (iii) The fluid contained within a blister will not cause further blister formation
  (b) Eyes
    (i) Itching
    (ii) Tearing
    (iii) Gritty feeling
    (iv) Burning
    (v) Photo phobia
  (c) Respiratory
    (i) Runny nose
    (ii) Sneezing
    (iii) Epistaxis
    (iv) Hoarseness
    (v) Hacking cough
(2) Moderate exposure - eyes
  (a) Reddening of the eye
  (b) Swelling of eyelids
  (c) Moderate pain
(3) Severe exposure
  (a) Eyes
    (i) Severe pain

(ii) Severe edema of the eyelids and conjunctiva
(iii) Corneal damage (e.g., ulcers, opacification)

(b) Respiratory
(i) Productive cough with clear, foamy sputum
(ii) Pulmonary edema
(iii) Cyanosis
(iv) Shock
(v) Cardiac failure

(c) Systemic effects
(i) Destruction of bone marrow's ability to produce RBCS, WBCS, and platelets
(ii) Nausea and vomiting

Treatment

(1) Don protective mask and go to MOPP level 4
(2) Decontaminate exposed skin with the M291 kit
(3) Apply calamine lotion or topical steroid for erythema (done after life-threatening conditions are corrected)
(4) Cover blisters less than the size of a quarter with petrolatum impregnated gauze dressings. If blisters are larger or numerous, evacuate for further treatment
(5) If eyes are affected
(a) Irrigate with saline or water from the casualty's canteen
(b) Place Vaseline on the eyelids to prevent sticking
(c) Do not cover eyes
(d) Evacuate immediately
(6) If respiratory system is affected
(a) Maintain airway
(b) Given humidified oxygen (if available)
(c) Provide mechanical ventilation with supplemental oxygen if needed
(d) Ensure casualty is kept at rest
(e) Evacuate immediately

Record the treatment given on the Field Medical Card

WARNING: Death is mainly a result of sepsis, infection, and pulmonary damage.

Effects and Treatment for Lewisite Agent Exposure

Effects

(1) Eyes
(a) Liquid form will cause rapid and devastating effects to the eye
(b) Pain and blepharospasm (involuntary contraction of eyelid muscles) experienced upon contact
(c) Swelling of the eyelids, conjunctiva and cornea
(d) Eyelids will normally be completely closed within one hour
(2) Skin

(a) Immediate pain which diminishes after blisters form
(b) Necrosis of the epithelium occurs within 5 to 10 minutes with area having a grey appearance
(c) Blisters are usually formed at the exposure site within 12 to 18 hours

(3) Respiratory
(a) Burning sensation of the nasal mucosa
(b) Pulmonary edema

Treatment

(1) Immediate decontamination using the M291 kit
(2) Eyes
(a) Irrigate with saline or water from the casualty's canteen
(b) Place Vaseline on the eyelids to prevent sticking
(c) Do not cover or bandage eyes
(3) Respiratory support
(a) Maintain airway
(b) Given humidified oxygen (if available)
(c) Provide mechanical ventilation with supplemental oxygen if needed
(d) Ensure casualty is kept at rest
(4) Cover blisters less than the size of a quarter with petrolatum impregnated gauze dressings. If blisters are larger or numerous, evacuate for further treatment
(5) Evacuate immediately for further supportive care (e.g., maintenance of fluid balance, nutrition)

Record the treatment given on the Field Medical Card

Effects and Treatment for Phosgene Oxime Agent Exposure

Effects

(1) Skin
(a) Pain on contact from either the liquid or solid
(b) Blanching along with a surrounding ring of erythema occurs 20 seconds after contact
(c) Wheal (similar to a bee sting) occurs within 30 minutes
(d) Necrosis of skin at the site of contact
(2) Eye
(a) Immediate pain
(b) Severe edema of the eyelids and conjunctiva
(c) Corneal Damage

Treatment

(1) Immediate decontamination using the M291 kit
(2) Eyes
(a) Irrigate with saline or water from the casualty's canteen
(b) Place Vaseline on the eyelids to prevent sticking
(c) Do not cover to bandage eyes
(3) Respiratory support

(a) Maintain airway
(b) Given humidified oxygen (if available)
(c) Provide mechanical ventilation with supplemental oxygen if needed
(d) Ensure casualty is kept at rest

(4) Evacuate immediately for further treatment of the necrotic skin

Record the treatment given on the Field Medical Card

(1) Recall the effects and treatment for Phosgene Oxime agent exposure.

Signs, Symptoms and Treatment for Cyanide Exposure (Hydrogen Cyanide), (Blood Agent)

Signs and symptoms of cyanide exposure

(1) Moderate, from low concentrations - within minutes
(a) Transient increase in rate and depth of breathing
(b) Dizziness
(c) Nausea and vomiting
(d) Headache

(2) Severe
(a) Convulsions - within 30 seconds
(b) Respiratory arrest - within 2-4 minutes
(c) Cardiac arrest - within 4-8 minutes

(3) The onset of symptoms may occur so rapidly that the casualty will have expired before the medic has a chance to render care

Treatment

(1) Contaminated environment
(a) Mask self then casualty
(b) Evacuate immediately to treatment facility for cyanide treatment (IV with sodium nitrite and sodium thiosulfate)
(c) Administer positive pressure ventilation, if available

(2) Non-contaminated environment
(a) Maintain casualty's airway
(b) Supplemental oxygen with assisted ventilation (if needed)
(c) Evacuate immediately to treatment facility for cyanide treatment (IV with sodium nitrite and sodium thiosulfate)

Record the treatment given on the Field Medical Card

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked M5 Bag or Combat Medic Vest System, oxygen administration equipment (if available), and blankets. You encounter a casualty with symptoms consistent with nuclear agent exposure. All other life threatening injuries have been treated.

Describe Nuclear Effects

Describe nuclear blast effects

(1) Initial blast wave
(2) Secondary–Projectiles debris
(3) Tertiary–Impact of being thrown. Wind drag can displace large objects and collapse buildings.

Medical effects from a nuclear detonation

Blast Injuries

(1) Two types of blast forces that occur in a nuclear detonation blast wave
  (a) Direct blast wave overpressure forces
  (b) Indirect blast wind drag forces
(2) Types of injuries
  (a) Primary injuries due to overpressures such as ruptured eardrums and lungs
  (b) Secondary injuries such as lacerations and puncture wounds can occur from primary and secondary missiles and falls and crush from debris
  (c) Concussion Injuries

Blunt injuries

(1) Foreign body impact - heavy, blunt missiles may not penetrate, but can result in significant injury, particularly fractures
(2) Acceleration and deceleration injuries

Thermal Injuries

Flash burns

(1) Thermal radiation travels outward from the fireball in a straight line
(2) Thermal intensity decrease with distance
(3) Close to the fireball, all objects will be incinerated

Indirect (flame) burns

(1) Result from exposure to fires caused by the thermal effects in the environment, particularly from ignition of clothing
(2) Could be the predominant cause of burns depending on the number of and characteristics of flammable objects in the environment
(3) Eye injury: the intense light of a nuclear fireball can cause flash blindness

Radiation Injury

(1) Casualties produced by ionizing radiation alone or with other injuries will be common
(2) Acute Radiation Injury on the Battlefield:

(a) Dose delivered quickly, usually over several minutes
(b) High doses are required for clinically observable effects
(c) Results from external whole body irradiation
(d) Exposure MUST be from gamma or neutrons
(e) Effects appear quickly usually within hours

(3) Acute Radiation Injury experience in man:
(a) Survivors of Hiroshima and Nagasaki
(b) Operation Castle (1954)
(c) Industrial and laboratory accidents
(d) Clinical radiotherapy
(e) Chernobyl

Assessment findings of exposure

Radiation Exposure

(1) Whole-body irradiation
(a) Absorbed doses are high and acquired over short periods of time
(b) Results in acute radiation sickness

(2) Three characteristic syndromes that occur with increasing doses
(a) Hematopoietic syndrome
(i) Low to mid range -lethal dose of radiation
(ii) Depression of bone-marrow function causing anemia
(b) Gastrointestinal syndrome
(i) Very serious prognosis - almost always accompanied by non-recoverable loss of bone marrow
(ii) Short latent period of a few days to a week – characterized by severe fluid loss, hemorrhage, and diarrhea
(c) Central Nervous System (CNS) / Cardiovascular syndrome
(i) Associated with absorbed doses in the lethal range
(ii) Rarely seen since heat and blast effect could cause immediate death
(iii) Latent period is very short - varying from several hours to 1 to 3 days

Mechanism of damage

(1) Cellular sensitivity determines organ and whole body response to a dose of radiation
(2) Cells are listed from MOST radiosensitive to least radiosensitive
(a) Lymphocytes
(b) Epidermal epithelium
(c) Erythrocytes
(d) Nerve cells
(3) Radiation effects at each level of biological organization depend on the killing of cells. As a result, the most sensitive organ system is the blood forming system followed by the gastrointestinal system.

Terminate exposure

Physically remove casualty from contaminated environment

(1) Evacuation removes casualties from the dangers associated with radioactive fallout
(2) Move the casualties perpendicular to the wind direction
  (a) This moves the casualties most quickly to a safe zone
  (b) Be aware that wind directions change frequently
(3) If evacuation is not possible, shelter personnel from fallout and radioactive contamination

Time, distance, and shielding

(1) Time or duration of exposure
  (a) Short duration can still be intense
  (b) The longer the period of exposure the more damage will be done
(2) Distance
  (a) The further away from the epicenter, the less intense the exposure
  (b) Move yourself and the casualty as far away from the epicenter as possible
(3) Shielding is best accomplished by placing as much distance and substance between you and the accumulating radioactive material
  (a) Two inches of steel, 6 inches of concrete, 8 inches of earth and 22 inches of wood will each reduce gamma radiation exposure by 50%
  (b) If fallout is, or you expect it to become, a significant exposure threat, locate or construct a shelter

Provide assessment/treatment for specific exposure

Clinical Course of Radiation Sickness

(1) Initial Stage (before rash and fever)
  (a) Symptoms: Relatively rapid onset of nausea, vomiting, and malaise
  (b) Short duration - generally a few hours
  (c) Incapacitation should not be severe enough to warrant evacuation
(2) Latent Phase
  (a) Relatively symptom-free
  (b) Duration varies with the dose

Symptoms

Frequently occur in the whole-body-irradiated casualties within the first few hours of post exposure

(1) Nausea and vomiting occur with increasing frequency as the radiation exceeds 100-200 cGy
  (a) Onset may be as long as 6-12 hours post exposure

(b) Vomiting within the first hours is associated with fatal doses

(2) Hyperthermia
(a) Significant rise in body temperature within the first few hours of potentially lethal radiation injury
(b) Fever and chills are associated with severe and life-threatening radiation dose

(3) Erythema - redness or inflammation of the skin or mucous membranes that is the result of dilation and congestion of superficial capillaries
(a) Developed within the first day of post exposure if casualty received a whole-body dose of more than 1000-2000 cGy
(b) Erythema is restricted to the affected area
(c) Less frequently seen as a symptom if the dose is lower but still in the potentially fatal range

(4) Hypotension
(a) A noticeable decline in systemic blood pressure if received lethal dose of whole-body radiation
(b) Severe hypotension after irradiation is associated with a poor prognosis

(5) Neurologic Dysfunction
(a) Almost all person who demonstrate obvious signs of damage to the central nervous system within the first hours post exposure have received a lethal dose
(b) Symptoms include mental convulsion, convulsions, and coma

Triage

A mass casualty situation is developed by a nuclear attack

(1) Immediate treatment group (T1). Those requiring immediate lifesaving surgery. Procedures should not be time-consuming and should concern only those with a high chance of survival, such as respiratory obstruction and accessible hemorrhage.

(2) Delayed treatment group (T2). Those needing surgery, but whose conditions permit delay without unduly endangering safety. Life-sustaining treatment such as intravenous fluids, antibiotics, splinting, catheterization, and relief of pain may be required in this group. Examples are fractured limbs, spinal injuries, and uncomplicated burns.

(3) Minimal treatment group (T3). Those with relatively minor injuries who can be helped by untrained personnel, or who can look after themselves, such as minor fractures or lacerations. Buddy care is particularly important in this situation.

(4) Expectant treatment group (T4). Those with serious or multiple injuries requiring intensive treatment, or with a poor chance of survival. These patients receive appropriate supportive treatment compatible with resources, which will include large doses of analgesics as applicable. Examples are severe head and spinal

injuries, widespread burns, or high doses of radiation; this is a temporary category.

The physician should make a preliminary diagnosis of radiation injury only for those casualties for whom radiation is the sole source of the problem

This is based on:

(1) Appearance of nausea
(2) Vomiting
(3) Diarrhea
(4) Hyperthermia
(5) Hypotension
(6) Neurologic dysfunction

Provide emergency medical care

Decontamination

(1) Soldiers from fallout areas may have fallout on their skin and clothing
(2) Soldier will not be radioactive, but may suffer radiation injury from the contamination
(3) Removal of the contamination
  (a) Should be accomplished as soon as possible, definitely before admission into a clean treatment area
  (b) Decontaminate the casualty's hood
  (c) Cut off the casualty's hood
  (d) Decontaminate the casualty's mask and exposed skin
  (e) Remove the casualty's Field Medical Card (FMC)
  (f) Remove gross contamination on the overgarment by wiping all visible contamination spots with a sponge soaked in 5% solution
  (g) Remove the casualty's protective overgarment jacket
  (h) Remove the casualty's protective overgarment trousers
  (i) Remove the casualty's butyl rubber gloves
  (j) Remove the casualty's protective overboots
  (k) Remove and secure the casualty's personal effects
  (l) Remove the combat boots following the same procedures as for removing the protective overboots
  (m) Cut off the casualty's battle dress uniform (BDU)
  (n) Cut off the casualty's undergarments
  (o) Remove the casualty's glove inner liners
  (p) Remove the casualty's socks
  (q) Decontaminate the casualty's ID tags
    (i) Decontaminate your butyl rubber gloves in the 5% solution
    (ii) Wipe the ID tags with the 0.5% solution
  (r) Move the casualty to the skin decontamination area
  (s) Perform spot skin decontamination

(i) Spot decontaminate potential areas of contamination with the M258A1 or M291 Skin Decontaminating Kit or the 0.5% solution
(ii) Pay particular attention to areas where gaps exist in the MOPP gear, such as the neck, lower part of the face, waistline, wrists, and ankles
(iii) Briefly wash or brush exposed skin (this will reduce 99 percent of contamination)

(t) Remove field dressings and bandages
(u) Decontaminate any splints
(v) Transfer the casualty to the shuffle pit

Treatment for Radiation Injury

(1) Start IV
(2) Administer antibiotics where appropriate
(3) Management of infection

Management of soldiers injured from the immediate effects of nuclear weapons

Flash, blast, thermal are the same as for conventional battlefield injuries - severity may be increased

(1) A burn is a burn regardless of whether it is caused by a nuclear explosion or by napalm and its management remains the same
(2) True of fractures, lacerations, mechanical injuries, and shock
(3) For most of the conventional injuries, standard first-aid procedures should be followed.
(4) Thermal Burns: (See Treat a Casualty with a Burn Injury
(a) Dressings for wounds and burns should follow a closed-dressed principle, with application of an adequate sterile dressing using aseptic techniques
(b) DO NOT close the wound, regardless of its size, unless authorized by a physician
(c) If signs of infection and fever develop, give ant biotics
(d) Overwhelming infection can develop rapidly from a burn caused by radiation
(e) Good nursing care and aseptic control of all procedures is a must; casualties should get plenty of rest, light sedation if they are restless or anxious, and a bland, nonresidue diet
(5) Penetrating injuries
(a) Fractured limbs Refer to Treat a Casualty with a Musculoskeletal Injury
(b) (b) Possible spinal injury Refer to Treat a Casualty with a Spine Injury
(c) (c) Head and torso. Refer to Treat a Casualty with a Head Injury and Treat a Casualty with a Chest Injury
(6) Pressure Trauma
(a) Breathing difficulty
(i) Edema
(ii) Fluid accumulation

(iii) If pulmonary embolus suspected place casualty head down on left side
(iv) Watch for developing dyspnea and poss ble tension pneumothorax: Consider plural decompression

NOTE: If any lung pressure injury signs are present consider the administration of 100% oxygen. (If available)

(b) Ear and bowel Injury
(i) Require supportive care only
(ii) Ear pain/hearing loss keep ear canals clean and suspect lung damage

NOTE: Hollow organs and open air spaces are more susceptible to barotrauma.

(iii) Bowel injuries present as abdominal pain
(iv) Consider limited duty of casualties with diminished hearing loss

(7) Radiation exposure considerations
(a) Consider ant biotic therapy and rehydration
(b) Keep other wounds clean
(c) Consider irrigation
(d) Apply sterile dressing if required

(8) Flash Injury

NOTE: When administering Morphine Sulfate, be aware of the indications and contraindications of this drug as they relate to burns. Indications: Severe acute or chronic pain, relieved dyspnea of acute left ventricular failure, pulmonary edema, and pain of a Myocardial Infarction (MI). Contraindications: Hypersensitivity to opiates, increased intracranial pressure, convulsive disorders, bronchial asthma, and respiratory depression, diarrhea caused by poisoning until the toxic material has been eliminated.

NOTE: Changes in fluid volume and tissue blood flow make absorption of any drug given intramuscularly or subcutaneously unpredictable. The intramuscular or subcutaneous routes should not be used and narcotics should only be given intravenously and in doses no larger than those needed to control pain.

Depleted Uranium (DU) Awareness

Characteristics

(1) DU is a heavy metal, that is 60% as radioactive as natural uranium found in the soil.

(2) Nuclear Fuel Cycle and Enrichment. It is termed “depleted„ because it is the waste that is left from the enrichment process of natural uranium. Natural uranium has three major isotopes (U-234, U-235, and U-238). The U-234 and U-235 are extracted from natural uranium ore to be used a nuclear of fission based fuel. The U-238 can not be used for reactor fuel or weapons grade uranium, thus is considered waste. About 99% of uranium ore is U-238, the other 1% is the most radioactive component of the ore.

(3) DU is very dense metal, about 1.6 times greater than lead.

(4) DU can be easily machined or working into different shapes. This allows it to be "molded" and fabricated for many industrial situations that require a very dense material.

Properties

(1) Chemically, DU is the same as natural uranium. It is a heavy metal, just l ke mercury, lead, or tungsten.

(2) DU is pyrophoric. DU will readily ignite when it str kes a target. This property is what eyewitness accounts of DU hits described as the enemy vehicle being engulfed in flame.

NOTE: DU is NOT fissionable material. It will no go critical regardless of the quantity or its configuration. All fissionable material (U-234/235 has been removed). DU rounds are not explosive, nor will they create a nuclear explosion when they hit a vehicle. They use their mass, properties, and high rate of velocity to penetrate vehicle’s armored skins (punches through).

Identification

(1) Spent Penetrator:
- (a) Rod shaped. If the penetrator is intact and has not impacted with a hard target, it may retain its original shape.
- (b) Color may be silver, green-black, black, or black-gold
- (c) Tungsten or other metals may be used as penetrators. These may look the same as the depleted uranium penetrator. The only way to POSITIVELY identify a DU penetrator is with a RADIAC meter. ASSUME ALL PENETRATORS FOUND TO BE DU.

(2) Burning Vehicles
- (a) M1A1 Abrams MBT may have depleted uranium in their armor plating. When penetrated, there may be DU in the smoke. Of course, DU will be in the air on the inside of the tank when it is hit and penetrated.
- (b) Any vehicle hit and penetrated with DU munitions may have the same conditions as above.

TERMINAL LEARNING OBJECTIVE

Given a standard fully stocked Combat Medic Vest System (CMVS) or fully stocked M5 Bag, IV administration equipment and fluids, oxygen, suction and ventilation equipment (if available), selected medications, documentation forms and personal chemical protective equipment. You encounter a casualty with symptoms consistent with biological agent exposure. All other life threatening injuries have been treated.

Identify Potential biological warfare agents and their characteristics

Potential Agents

Biological agents that may be used as weapons can be classified as follows:

(1) Bacteria-are small free-living organisms
(2) Viruses-are organisms which require living cells in which to replicate
(3) Rickettsiae-are microorganisms which have characteristics common to both bacteria and viruses carried by parasites
(4) Chlamydia-are obligatory intracellular parasites incapable of generating their own energy source
(5) Fungi- are primitive plants, which do not utilize photosynthesis, are capable of anaerobic growth, and draw nutrition from decaying vegetable matter
(6) Toxins- are poisonous substances produced and derived from living plants, animals, or microorganisms; some toxins may also be produced or altered by chemical means

Characteristics of biological agents

Intrinsic features of biological agents that influence their potential for use as weapons include-

(1) Infectivity -Reflects the relative ease with which microorganisms establish themselves in a host species
(2) Virulence -Reflects the relative severity of disease produced by the agent
(3) Toxicity -Reflects the relative severity of illness or incapacitation produced by a toxin
(4) Pathogenicity -Reflects the capability of an infectious agent to cause disease in a suscept ble host
(5) Incubation period -Reflects the time between exposure to an agent or toxin and the appearance of symptoms
(6) Transmissibility -Reflects the relative ease in which an agent is passed from person to person
(7) Lethality -Reflects the relative ease in which an agent causes death in a susceptible population
(8) Stability -Reflects an agents ability to remain viable when exposed to environmental factors, including temperature, relative humidity, atmospheric pollution, and sunlight
(9) Additional factors - Suitability of a microorganism or toxin for use as a weapon may be influenced by factors such as ease of production; stability when stored or transported; and ease of dissemination

Potential Methods and Optimum Times for Dissemination of Biological Agents

Potential methods of dissemination

(1) Aerosol - live microorganisms can be introduced into the air in a wet aerosol. The use of an aerosol is considered more likely than any other method

(2) Large liquid drops - using large liquid drops of agent, usually toxins, will cause ground contamination which is similar to a persistent chemical agent

(3) Arthropod vector - least likely to be used because
- (a) Cost of producing the vectors
- (b) Controlling the vectors after their release
- (c) Natural predators that might destroy the vectors

(4) Covert - use of a biological agent by a terrorist group is a potential threat against
- (a) Large population centers
- (b) Military targets
- (c) Political targets

The same routes of entry pertinent to natural spread of diseases are also relevant when their etiologic agents are delivered intentionally by weapons.

Aerosol delivery of an agent or toxin could result in exposure through one or more of the following routes

(1) Respiratory exposure
- (a) Aerosol delivery systems aim to generate invisible clouds with particles or droplets between .5 and 10 microns in diameter
- (b) Inhalation of agent aerosols provides a direct pathway to the systemic circulation
- (c) Natural process of breathing causes a continuing influx of biological agent to exposed individuals

(2) Ingestion. Food and water supplies may be contaminated by an aerosol delivered attack. Consumption could result in exposure and disease.

(3) Dermal exposure. Intact skin provides an excellent barrier against infection. Mucous membranes and damaged skin constitute breaches in this normal barrier through which agents may pass.

Contamination of food and water

Direct contamination of consumables, such as drinking water, food stuffs of medications could be used as a means to disseminate infectious agents or toxins

(1) Most l kely be the result of sabotage efforts used against military units or bases

(2) Filtration and chlorination significantly reduces this hazard in regards to water supplies

(3) Arthropod vector releases; can be used to release infected natural and unnatural arthropod hosts such as mosquitoes, fleas, or ticks

Optimum time for dissemination

The hours between dusk to dawn present the optimum time for dissemination for the following reasons:

(1) Inactivation of biological aerosols by ultraviolet radiation is minimal
(2) Prevailing atmospheric conditions allow an agent cloud to travel great distances

Categories and Definitions of Biological Agents

Pathogens

Are disease producing microorganisms, such as bacteria, mycoplasma, rickettsia, fungi, or viruses. Carried by arthropods, rodents, monkeys, or man

Toxins

Are poisons naturally produced through the activities of living organisms. Produced by plants, microorganisms and animals

Other agents of biological origin

(1) The human body has a very small quantity of biological agents
(2) For example: bioregulators/modulators (BRM) can be small molecules or peptides that act as neurotransmitters and/or modifiers of neural responses
(3) If introduced in large quantities, will cause severe adverse effects or death

Indicators of a Biological Warfare Attack

The U.S. Army does not have equipment that will detect and identify biological agents

All soldiers need to be aware of certain indicators that indicate an attack is occurring or has occurred

(1) Mysterious illness in both the soldier and civilian population which approaches epidemic numbers
(2) An unusual, unknown, or uncommonly seen disease or syndrome for the particular geographical area
(3) Large number of insects that are unusual, unnatural for the area, or have significantly increased in number
(4) Deaths of animals in the region from unknown causes or from the same diseases as human victims
(5) Mist or fog sprayed by slow moving aircraft or helicopter
(6) Artillery shells which detonate with less powerful explosions than HE rounds
(7) Aerial bombs that pop as opposed to exploding

Methods of Defense Against a Biological Agent Attack

Pre-attack

(1) Ensure all soldiers have updated routine immunizations and immunize them against the specific anticipated biological threat, if an immunization exists for the particular agent(s). Medical intelligence agencies will provide warnings as needed
(2) Maintain personal hygiene and physical fitness

(3) Maintain field sanitation guidelines

During attack

(1) Reduce respiratory exposure by donning the M40 series protective mask
(2) Wear the battle dress overgarment, chemical protective boots, and gloves
(3) Utilize a protective shelter that has a filtered air supply

Post-attack - decontamination

(1) Personnel - decontaminate exposed skin with the M291 decontamination kit or use warm soapy water to remove the agent
(2) Equipment - use M295 individual equipment decontamination kit or the M11, M13 portable decon apparatus
(3) Food and water - seal or box foodstuffs and boil water for 15 minutes

Actions after a Biological Agent Attack

Continue mission only if it will not spread the contamination to non-exposed personnel

Identify the agent

(1) To institute a specific treatment
(2) To institute measures to control the exposure
(3) To confirm that an attack occurred
(4) To estimate time of exposure
(5) To estimate number of possible casualties
(6) To get intelligence as to the enemy's biological capability

Administer medical treatment

(1) Monitor and support both cardiac and respiratory functions
(2) Treat for shock
(3) Administer appropriate therapy and/or medication if the specific agent is known and the medication is available
(4) Protect patient from further biological agent exposure
(5) Complete the field medical card
(6) Evacuate the patient
    (a) Notify the evacuation personnel at the battalion aid station (BAS) of the biological casualty
    (b) Ensure that both the patient and evacuation personnel are in protective clothing
    (c) The patient will be treated and held at the BAS to prevent further spreading of the contamination

TERMINAL LEARNING OBJECTIVE
Given a scenario involving a Casualty Decontamination Station (CDS).

Components, Function(s), Location, Description, and Equipment of a Casualty Decontamination Station (CDS)

Triage station
- (1) Function - to receive patients from the ambulance and conduct triage
- (2) Location - area located near the contaminated ambulance drop off point
- (3) Description
  - (a) Senior medic oversees the unloading of the ambulances, performs triage, stabilizes patients, and provides treatment
  - (b) Personnel in MOPP level 4
  - (c) Ambulatory patients routed through a parallel decontamination line. Non-medical personnel is assigned to assist ambulatory patients with decon process
- (4) Equipment
  - (a) M8 chemical detection paper
  - (b) M9 chemical detection paper
  - (c) Chemical agent monitor

Contaminated emergency treatment area (CETA)
- (1) Function - to stabilize patients with life threatening injuries prior to decontamination
- (2) Location - optional area, adjacent to the triage station
- (3) Description
  - (a) Senior medic oversees the unloading of the ambulances, performs triage, stabilizes patients, and provides treatment
  - (b) Personnel in MOPP level 4
  - (c) Ambulatory patients routed through a parallel decontamination line. Non-medical personnel is assigned to assist ambulatory patients with decon process
    - (i) If CETA is used, a second medic (not senior) will perform patient treatment
    - (ii) Patient must be stabilized prior to being decon
- (4) Equipment
  - (a) M8 chemical detection paper
  - (b) M9 chemical detection paper
  - (c) Chemical agent monitor
  - (d) Suction apparatus (battery operated and manual)
  - (e) Oxygen tank with a delivery system
  - (f) Airway adjuncts
  - (g) Resuscitator, hand operated
  - (h) Field dressing, cravats, and tourniquets
  - (i) Nerve agent antidote kits
  - (j) Atropine auto injectors
  - (k) Convulsant antidote nerve agent injectors
  - (l) IV supplies (Fluids, tubing, catheters, iodine pads, tape, constricting bands)

Decontamination area

(1) Function - consists of a clothing removal station and a skin decontamination station
  (a) Clothing removal station - removal of all clothing and equipment, except for protective mask, dressings, bandages, splints, and tourniquets
    (i) Clothing and equipment are cut one layer at a time
    (ii) After clothing has been removed, the litter patient is transferred to a decontamination litter via a three-person log roll
  (b) Skin decontamination station - completely decontaminate the patient's skin and protective mask
    (i) Decontaminate or replace medical items such as the protective mask, dressing, bandages, splints, and tourniquets
    (ii) Calcium hypochlorite - 0.5% is used to decontaminate the skin and 5% is used for clothing and equipment
(2) Location - on "dirty" side of the "hot line"
(3) After skin decontamination, the patient is checked with M8 paper or the CAM, then moved to the shuffle pit
(4) Description
  (a) All activities in this area are overseen by one medic
  (b) Non-medical personnel are utilized to perform the functions in this area
  (c) Areas must be set aside for the storage of decontamination litters and waste receptacles
  (d) Personnel are dressed in MOPP level 4 and wear butyl rubber aprons over their battle dress overgarments to protect themselves from the patient's contamination
(5) Equipment
  (a) Each station has two litter support stands
  (b) Two personnel are assigned for each litter stand that is set up
  (c) Two buckets - one with 0.5% chlorine (Cl) solution for all skin decontamination and the other with 5% chlorine solution personal equipment
  (d) One sponge per bucket
  (e) A minimum of two pairs of 7.25" angled bandage scissors per station
  (f) Chemical protective gloves for each soldier
  (g) Butyl rubber apron for each soldier
  (h) M8 chemical detection paper booklets

Shuffle pit

(1) Function - litter exchange from contaminated to uncontaminated side
  (a) Patient is then retriaged by the senior medic of the clean side

(b) The field medical card is copied on the "clean" side, and the "dirty" one is destroyed

(2) Location - actual line between the clean treatment and the decontamination areas

(3) Description
- (a) The medic located on the uncontaminated side supervises personnel at the shuffle pit
- (b) Area is large enough so that both the litter bearers can completely stand within its boundaries. It is dissected in half by an imaginary line referred to as the "hot line"
- (c) The hot line separates the dirty side from the clean side. Contaminated personnel and equipment are not allowed to cross the hot line
- (d) The top 3-6 inches of the surface soil in the shuffle pit is mixed with super tropical bleach (STB), at the ratio of two parts STB to three parts soil

(4) Equipment
- (a) Litter stands
- (b) Super tropical bleach

Treatment area

(1) Function - consists of a clean treatment area and a collective protective shelter
- (a) Clean treatment area - to re-triage casualties by the clean side medic
- (b) Collective protective shelter (CPS) - MD/PA treats patients with serious injuries

(2) Location - between shuffle pit and evacuation area on the clean side

(3) Description
- (a) Clean treatment area - treat the ambulatory patients with minor injuries and send them to disposition point for evacuation rearward or returned to duty
- (b) Collective protective shelter (CPS)
  - (i) Patients are routed directly to the CPS from the shuffle pit if they have serious injuries
  - (ii) MD/PA located in CPS provide care
  - (iii) Patients enter and exit through an air lock so as to keep contamination out of the CPS. Personnel inside the CPS are in MOPP level 0. The CPS can be an open-air facility with overhead cover that is at least 45-50 meters upwind from the shuffle pit. Patients leaving the CPS will be in patient protective wrap

(4) Equipment - no special equipment required

Evacuation/holding area

(1) Function - patient waiting area for evacuation to rearward medical facility

(2) Location

(a) Area is placed under a cover which overlaps both the clean treatment area and the CPS
(b) The clean ambulance pickup point is located upwind of the evacuation/holding area

(3) Description - patient waiting area for evacuation
(4) Equipment - no special equipment required

Triage Considerations and Categories

Triage considerations

(1) The senior medic performs triage on all the patients immediately upon arrival at the CDS
(2) All patients are screened with the chemical agent monitor to determine the following
(a) If an exposure to a chemical agent has occurred
(b) The type of chemical agent exposure
(3) Patients that are not contaminated are routed directly to the clean treatment area

Triage categories

(1) Immediate
(a) Patient has signs and symptoms of severe, life-threatening wounds or injuries without any chemical injuries
(b) Signs and symptoms may include - shock; burns on the face, neck, hands/feet, perineum, genitalia; obstructed airway; respiratory failure
(2) Chemical immediate
(a) Patient has signs and symptoms of life-threatening chemical injuries without any conventional injuries
(b) Signs and symptoms may include - labored breathing, coughing, vomiting, profuse sweating, weak pulse, and marked salivation
(3) Delayed
(a) Patients with conventional injuries that are not life-threatening. Also, they exhibit mild signs and symptoms of chemical agent poisoning
(b) Signs and symptoms may include - severe eye injuries, open wounds to the chest without respiratory distress, open/penetrating abdominal injuries without shock, open wounds/fractures, and second/third degree burns over 20% of the body
(4) Minimal
(a) Patient has no signs and symptoms of chemical agent poisoning, but they do have minor conventional injuries
(b) Following are examples of patients in this category - sprains, strains, closed fractures, minor lacerations and contusions, minor combat stress, individuals that only require treatment by the medic, individuals that can be returned to duty within 48-72 hours, and individuals that can receive full treatment at CDS

Expectant

(a) Patients whose injuries are so extensive that even if they were the only casualty and had the benefit of intensive and thorough medical treatment, their survival would still be unlikely

(b) Examples of these types of injuries would be - Massive head injuries with signs of impending death, second/third degree burns over more than 85% of the body, cardiac arrest patients (unless personnel resources are available to assist them), and patients with both severe chemical agent poisoning and conventional life-threatening injuries

TERMINAL LEARNING OBJECTIVE

You are supervising the contaminated side of an established chemical decontamination station. Medical personnel and nonmedical augmentees are in MOPP level 4. Chemically contaminated casualties have been triaged by the senior medic and have been routed to your area for decontamination. Necessary materials and equipment: M291 decontamination kit, 5% chlorine solution, 0.5% chlorine solution, butyl rubber aprons, butyl rubber gloves, stainless steel buckets, cellulose sponges, water source, plastic bags, litters, litter stands, bandage scissors, M8 chemical detection paper, chemical agent monitor (CAM), contaminated disposal containers, bandages, gauze, and tourniquets.

Definition and Principles of Decontamination

Definition

(1) Contamination - the deposition and/or absorption of biological or chemical agents, or radiological material on or by structures, areas, personnel, or equipment

(2) Decontamination - removal or neutralization of hazardous levels of nuclear, biological, or chemical contamination from personnel and material

Reasons for Decontamination

(1) Lethality - Some kinds of contamination are so lethal that they can kill or incapacitate if they contact exposed skin for only a few minutes

(2) Performance degradation - Mission oriented protective posture (MOPP) gear provides protection but also reduces efficiency
- (a) Creates awkwardness
- (b) Tires and discourages soldiers
- (c) Reduces efficiency
- (d) Reduces field of view
- (e) Resting and sleeping are difficult
- (f) Soldiers cannot eat
- (g) Urinating and defecating are potentially dangerous
- (h) Reduces command, control, and communications (C3)

(3) Equipment limitations - Although MOPP gear will provide protection from most chemical and biological agents, it cannot protect the soldier forever.
- (a) Contamination will eventually penetrate
- (b) Water, fuel, grease, and oil could defeat the protection qualities.
- (c) Provides little direct protection from radiological contamination
- (d) Equipment must be decontaminated in order to be used.

(4) Spread - Unless decontamination is done early, contamination will spread and cause a more extensive hazard
- (a) Soldiers climbing in and out of vehicles
- (b) Contaminated equipment evacuated for repair
- (c) Contaminated supplies and ammunition flowing forward

Principles of Decontamination

(1) Decontaminate as soon as possible
  (a) The most important principle
  (b) The sooner the contamination is removed, the sooner MOPP levels can be reduced and combat potential restored
(2) Decontaminate only what is necessary - Consider the following factors:
  (a) Mission
  (b) Time available
  (c) Degree of contamination
  (d) Length of time the unit has been in MOPP 4
  (e) Decontamination assets available
(3) Decontaminate as far forward as possible
  (a) Keep equipment on or near the operational area
  (b) Allows decontamination to begin earlier
  (c) Limits the spread of contamination to other areas
(4) Decontaminate by priority
  (a) Mission essential first
  (b) Nonmission essential last

Decontaminants

Natural decontaminants

Natural decontaminants are readily available and frequently occurring in nature and are generally employed in field expedient methods of decontamination

(1) Water - Flush contamination from surfaces with large quantities of water
  (a) Used for - nuclear, biological, and chemical
  (b) Cautions - effective in physically removing contamination but does not neutralize the contamination
(2) Steam - accompanied by scrubbing is more effective than the use of steam alone.
  (a) Used for - nuclear, biological, and chemical
  (b) Cautions - effective in physically removing the contamination. However, contamination may not be neutralized.
(3) Absorbents - used to physically remove gross contamination from surfaces
  (a) Used for - chemical removal
  (b) Cautions - The absorbent becomes contaminated and must be disposed of accordingly
  (c) Examples - earth, sawdust, ashes, rags, and similar material
(4) Sealants - used to physically seal in or shield contamination
  (a) Used for - nuclear, biological, and chemical
  (b) Cautions - break in the surface of the sealant will expose the contamination. Contaminated areas covered with sealants must be marked with appropriate NBC warning signs.

(c) Examples - concrete, asphalt, earth, paint, and similar materials

Standard decontaminants

Standard decontaminants are most often used and are available through the supply system and are stocked for contingency operations

(1) STB (supertropical bleach) - a mixture of chlorinated lime and calcium oxide (white powder) with 30 percent available chlorine
  (a) Effective against
    (i) Nerve agents, both V and G series
    (ii) Blister agent, lewisite only
    (iii) Biological agents
  (b) Gives off toxic vapors on contact with G agents.
  (c) A 30-minute contact time is required.
  (d) Corrosive to most metals and injurious to most fabrics (thorough rinse required; metal surfaces must be oiled afterwards)

(2) DS2 (decontaminating solution #2) - a mixture of 70% diethylenetriamine (DETA), 28% 2-methoxyethanol (methyl cellosolve), and 2% sodium hydroxide
  (a) Effective against
    (i) All known chemical agents
    (ii) Biological agents (except spores) with sufficient contact time
  (b) Available in 1 1/3 quart cans, 14 liter containers, or in 5-gallon drums
  (c) A protective mask and rubber gloves must be worn when using DS2 (extremely irritating to skin) (MOPP 4).
  (d) Ignites spontaneously on contact with STB and HTH (calcium hypochlorite)
  (e) Corrodes aluminum, cadmium, tin, and zinc; softens leather; may soften, remove, and discolor paints
  (f) Can be used in temperatures down to 25° Fahrenheit
  (g) Thirty minutes contact time for VX or 8-10 minutes for mustard and G agents

(3) Other standard decontaminants include:
  (a) Mask the sanitation solution calcium hypochlorite (HTH); effective against chem/bio agents
  (b) Soaps and detergents - When they are mixed with (hot) water, they are effective against nuclear and chem/bio agents

Nonstandard decontaminants

Nonstandard decontaminants are not frequently used. Some of these items can be found in the open market and available in the supply system but for other primary purposes. They may be utilized for decontamination.

(1) Caustic soda (sodium hydroxide)
(2) HTH (calcium hypochlorite) or HTB (high-test bleach)
(3) Bleach (sodium hypochloritehousehold bleach)
(4) Washing soda (sodium carbonate)
(5) Organic solvents (gasoline, kerosene, diesel, and alcohol)
(6) Acids (sulfuric, hydrochloric, and acetic acids)

Decontaminate the casualty

Decontaminate the casualty's hood
Cut off the casualty's hood
Decontaminate the casualty's mask and exposed skin
Remove the casualty's Field Medical Card (FMC)
Remove gross contamination on the overgarment by wiping all visible contamination spots with a sponge soaked in 5% solution
Remove the casualty's protective overgarment jacket
Remove the casualty's protective overgarment trousers
Remove the casualty's butyl rubber gloves
Remove the casualty's protective overboots
Remove and secure the casualty's personal effects
Remove the combat boots following the same procedures as for removing the protective overboots
Cut off the casualty's battle dress uniform (BDU)
Cut off the casualty's undergarments
Remove the casualty's glove inner liners
Remove the casualty's socks
Decontaminate the casualty's ID tags

Nuclear, Biological and Chemical
Appendix A
NBC Equipment Overview Skill Sheets

NBC Equipment Overview

Enemy has capability to employ nuclear, biological, and chemical weapons. Unit is at MOPP 0 unless intelligence indicates MOPP 1 is necessary. Effective downwind messages and chemical downwind messages are being received. This task is always performed in MOPP 4.

Medical platoon prepares for NBC environment without interruption of the mission. Medical platoon takes actions necessary to minimize effects of friendly nuclear blast within 30 minutes prior to detonation.

NBC Equipment Overview
Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Leaders issue NBC defense equipment. (1) Issue to each soldier individual NBC defense equipment authorization by TOE and application common table of allowances (CTA). (2) Check to ensure that unit NBC defense equipment authorized by TOE and applicable CTA is operational and is issued to designated, trained, and knowledgeable operators. (3) Identify shortages, and take replacement action. (4) Fill decontamination apparatus.	P / F	P / F	P / F
b.	Medical platoon member check M258A1 kit. (1) Check components to ensure expiration dates have not been reached. (2) Check to ensure kit contains a minimum of five samplers -- detectors, instruction card, and NBC M8 paper.	P / F	P / F	P / F
c.	Leaders adjust operations based on the situation. (1) Check to ensure subordinates are equipped to comply with MOPP level. (a) Each soldier carries protective mask with hood, skin decontamination kit, and detector paper. (b) In MOPP 0, the soldier carries or stores nearby mask, overgarment, overboots, and gloves. (c) In MOPP 1, the soldier wears overgarment with M9	P / F	P / F	P / F

	paper affixed and carries overboots, gloves and mask. (2) Inform ambulance teams of location of protective shelters. (3) Direct platoon members to harden positions (a) Improve fox holes and bunkers. (b) Locate natural and man-made features which provide protection (4) Check to ensure M13 decontamination apparatus if full. (5) Fill decontamination apparatuses. (6) Identify shortages of NBC equipment and request resupply as needed. (7) Enforce field sanitation measures.			
d.	Medical platoon members prepare for nuclear attack. (1) Warn personnel. (2) Medical platoon members place vehicles and equipment in a position that provides the best terrain shielding. (3) Turn off and disconnect nonessential electronic equipment. Tie down essential antennas and take down nonessential antennas and antenna leads. (4) Improve shelters giving consideration to blast, thermal, and radiation effects. (5) Zero dosimeters, if available. (6) Secure loose, flammable, explosive items, food, and water containers. Protect them from nuclear weapon effects. (7) Leaders check to ensure individuals know the appropriate action if an attack occurs. (8) Leaders conduct periodic monitoring. (9) Take additional actions	P / F	P / F	P / F

	consistent with the tactical and medical situation.			
e.	Medical platoon members prepare for a chemical attack. (1) Leaders warn teams. (2) Determine and follow MOPP-level guidance. (a) Ensure all individuals are at or above required MOPP-level (b) Adjust levels based on weather, work rate, and threat (c) Identify activities that become more difficult due to MOPP and take actions to compensate (3) Use expendable or readily decontaminated material to cover all equipment, munitions, POL, food, and water containers that cannot be placed in a shelter. (4) Place detector paper to provide maximum exposure to toxic rain and where it can be easily observed. (5) Check to ensure M258A1 kits are serviceable and are issued down to crew level. (6) Fill decontaminating apparatuses. (7) Leaders check to ensure individuals know the appropriate action if an attack occurs. (8) Take additional actions consistent with the tactical situation.	P / F	P / F	P / F
f.	Medical platoon members prepare for a friendly nuclear str ke. (1) Acknowledge warning (STRIKWARN). (2) Leaders warn and advise platoon personnel of: (a) Time, location, and area coverage of the planned decontamination. (b) Element vulnerability to immediate effects and residual contamination. (c) Measures required to	P / F	P / F	P / F

	prevent casualties, damage, and interference with the mission. (3) Leaders monitor to ensure platoon personnel execute directed actions. (a) Minimize skin exposure by rolling down sleeves, buttoning collars, or wearing additional clothing, such as MOPP gear. (b) Take cover in foxholes, bunkers, armored vehicles, basements, culverts, caves, or tunnels. (c) Place vehicles so that terrain provides shielding. (d) Protect electronic equipment from electromagnetic pulse (EMP) by removing or tying down antennas and disconnecting power and antenna leads. (e) Move loose items that could be blown around by the explosion so that they do not represent a hazard. (f) Warn all individuals. (g) Leaders brief personnel on the actions to take and when to take them. (4) Leaders implement protective measures as directed by company HQ. (5) Complete actions before detonation occurs.			

Instructor Comments:

Nuclear, Biological and Chemical
Appendix B
NBC Decontamination Skill Sheets

NBC Decontamination

Persistent agent attack has occurred, or contamination has been picked up from crossing a contaminated area. Unit has assumed MOPP level 4. Replacement overgarments, M291 and M280 decontamination kits, brooms, mops, supertropical bleach, or other expedient chemical defense items are on hand.

This task is always performed in MOPP4.

Decontamination measures are started immediately and personnel are decontaminated within 15 minutes and recontaminated is neglig ble.

NBC Decontamination
Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Decontaminated casualty's hood. (1) Covered the mask air inlets with hand. Instructed casualty to cover if able. (2) Wiped off front, sides, and top of hood with a cellulose sponge soaked with 5% calcium hypochlorite solution or use M291 skin decontaminating kit. (3) Uncover mask air inlets.	P /	P / F	P / F
b.	Cut off casualty's hood. (1) Dip scrubs and scissors in 5% solution. (2) Cut hood neck cord. (3) Cut away the drawstring below voicemitter. (4) Released or cut hood shoulder straps. (5) Unzipped hood zipper. (6) Began cutting at zipper, below voicemitter. (7) Proceeded cutting upward, close to filter inlet covers and eye lens outserts. (8) Cut upward to tope of eye lens outserts. (9) Cut across forehead to outer edge of next eye outsert. (10) Cut downward toward patient's shoulder, staying close to eye lens outserts and filter inlet covers. (11) Cut across the lower part of voicemitter to the zipper. (12) Dipped the scissors and rinsed gloves in 5% solution. (13) Cut from center of forehead, over top of head. (14) Folded left and right sides of hood to sides of casualty's head, laying the sides of hood on litter.	P /	P / F	P / F
c.	Decontaminated casualty's mask and exposed skin. (1) Used M291 skin decontamination	P /	P / F	P / F

	kit or 5% solution. (2) Covered mask air inlets. (3) Decontaminated exterior of mask. (4) Wiped down all exposed skin areas, to include neck and behind the ears. (5) Uncovered the mask air inlets.			
d.	Removed casualty's Field Medical Card (FMC). (1) Cut FMC tie-wire, allowing FMC to fall into plastic bag. (2) Sealed plastic bag and rinsed bag with 5% solution. (3) Placed plastic bag under protective mask head straps.	P /	P / F	P / F
e.	Removed gross contamination on the overgarment by wiping all visible contamination spots with a sponge soaked in 5% solution.	P /	P / F	P / F
f.	Removed the casualty's protective overgarment jacket. (1) Cut sleeves from cuff up to shoulder of jacket, then through the collar. Kept the cuts close to inside of the arms so that most of the sleeve material can be folded outward. (2) Unzipped the jacket. (3) Rolled chest sections to the respective sides, with inner black liner outward. Carefully tuck cut jacket between arm and chest. (4) Rolled cut sleeves away from the arms, exposing black liner.	P /	P / F	P / F
g.	Removed the casualty's protective overgarment trousers. (1) Cut the trouser legs from the ankle to the waist. Kept cuts near insides of legs, along inseam, to the crotch. (2) Folded cut trouser halves onto the litter with contaminated sides away from the casualty. (3) Rolled inner leg portion under and between the legs.	P /	P / F	P / F
h.	Removed the casualty's butyl rubber gloves. (1) Decontaminated your butyl rubber gloves in 5% solution. (2) Lifted casualty's arm up and out of the cutaway sleeve unless contraindicated by casualty's	P /	P / F	P / F

	condition. (3) Pulled butyl rubber gloves off by rolling cuff over fingers, turning the glove insider out. Did not remove white glove liners. (4) Lowered the casualty's arms and folded them across chest. (5) Placed gloves in contaminated disposal container. (6) Decontaminated butyl rubber gloves in 5% solution.			
i.	Removed the casualty's protective overboots. (1) Stood at foot of litter facing casualty. (2) Cut protective overboot laces. (3) Grasped heel of protective overboot with one hand and the tow of protective overboot with the other hand. (4) Pulled heel downward and then toward you until the overboot is removed. (5) Placed the overboots in contaminated disposal container.	P /	P / F	P / F
j.	Removed and secured the casualty's personal effects. (1) Removed casualty's personal articles from overgarment and BDU pockets. (2) Placed articles in plastic bags. (3) Labeled the bags with casualty's name and SSN. (4) Sealed plastic bags. (5) If articles are not contaminated, returned them to casualty. If articles are contaminated, placed bags in contaminated holding area until can be decontaminated.	P /	P / F	P / F
k.	Removed the combat boots following the same procedures as for removing the protective overboots.	P /	P / F	P / F
l.	Cut off the casualty's battle dress uniform (BDU). (1) Cut off BDU shirt. (2) Unbuckled or cut belt material. (3) Cut off BDU trousers following the same procedure as for protective overgarment trousers.	P /	P / F	P / F
m.	Cut off the casualty's undergarments. (1) Cut off underpants.	P /	P / F	P / F

	(2) Cut off T-shirt. (3) Cut off brassiere, if necessary.			
n.	Removed the casualty's glove inner liners. (1) Removed glove liners using same procedures as for removing butyl rubber gloves. (2) Crossed casualty's arms over chest.	P /	P / F	P / F
o.	Removed the casualty's socks. (1) Decontaminated your butyl rubber gloves in 5% solution Positioned yourself at the foot of the litter (2) Removed each sock by rolling it down over the foot, turning it inside out or by cutting the sock off (3) Placed the socks into a contaminated disposal container	P /	P / F	P / F
p.	Decontaminated the casualty's ID tag's (1) Decontaminated your butyl rubber gloves in the 5% solution (2) Wiped the ID tags with the 0.5% solution	P /	P / F	P / F
q.	Removed field dressings and bandages. (1) Carefully cut off dressings and bandages (2) Cut off any remaining clothing that was covered by the dressings and bandages (3) Decontaminated the exposed areas of skin with the 0.5% solution (4) Irrigated the wound with the 0.5% solution if the wound is suspected to be contaminated (5) Placed removed dressing and clothing in contaminated disposal container.	P /	P / F	P / F
r.	Replaced any tourniquets. (1) Decontaminated an area above the existing tourniquet (2) Placed a new tourniquet 1/2 to 1 inch above the old tourniquet (3) Removed the old tourniquet (4) Removed any remaining clothing or dressings covered by the old tourniquet (5) Decontaminated the newly exposed areas (6) Placed the removed tourniquet, dressings, and clothing in a			

	contaminated disposal container			
s.	Decontaminated any splints. (1) Stabilized the splinted extremity (2) Decontaminated the splint and the extremity by liberally flushing them with the 0.5% solution	P /	P / F	P / F
t.	Checked casualty for contamination. (1) Used M8 chemical agent detector paper or the chemical agent monitor (CAM) (2) Decontaminated any areas of detected contamination, as necessary	P /	P / F	P / F

Instructor Comments:

Nuclear, Biological and Chemical
Appendix C
Establish a Protective Decontamination Shelter &
Chemical Protective Biological Shelter Skill Sheets

Chemical Protective Biological Shelter

Unit receives chemical strike warning or report in the area of operations. CPBS are available. Five augmentee personnel are available from the supported unit to perform patient decontamination. NBC conditions are l kely to be a factor in mid-to-high intensity.

This task is always performed in MOPP4.

Decontamination station is operational within 45 minutes of WARNING.

Chemical Protective Biological Shelter
Soldiers Name: _____ _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Treatment section provides tailgate medical services. (1) Immediately assumes MOPP level as directed. Increases MOPP level if necessary. Remains in MOPP while operating outside CBPS. (2) Provides emergency medical services within five minutes. Continues in CBPS is operational and decontamination, triage, and holding area outside the shelter are established.	P / F	P / F	P / F
b.	Treatment section and augmentee personnel erect CBPS. (1) Erect one CBPS with all necessary medical equipment placed inside. Become operational and are prepared to receive first patient within 45 minutes. (2) Establish and disestablish shelter as directed. (3) Platoon sergeant supervises personnel performing assigned specific tasks in erecting shelter. (4) Erect only one CPBS. The second shelter remains on trailer and is protected against chemical contamination. Use this shelter upon relocation of treatment element. (5) Pad all litter stands and equipment placed on the floor of the CBPS to prevent puncture of the floor. (6) Place medical equipment and supplies in treatment area. Place litter stands in shelter. Place plastic bags and clean	P / F	P / F	P / F

	FMCs in airlock. Place patient protective wraps (PPW) in the shelter.			
c.	Treatment section and augmentees establish overhead cover. (1) Establish decontamination and holding areas. (2) Erect plastic sheeting downwind of CBPS, overlapping airlock entrance for the decontamination and triage area. (3) Erect plastic sheeting adjacent to the first sheeting and the side of the CBPS opposite the generator for the evacuation holding area. (4) Erect sheeting within ten minutes. (5) Check to ensure sheeting for decontamination and triage area measures at least 6 meters by 15 meters. (6) Check to ensure sheeting for holding area measures at least 6 meters by 7.6 meters. (7) Do not erect overhead cover if wind speed is greater than 10 knots.	P / F	P / F	P / F
d.	Treatment section and augmentees establish shuffle pit. (1) Position shuffle pit 3 to 4.6 meters from center of airlock entrance. Enter shuffle pit not less than 3 meters nor more than 4.6 meters away from the CBPS airlock. (2) Dig shuffle pit, 3 meters wide by 1.2 meters long by 15 cm deep, within ten minutes, (humus soil), while CBPS is being inflated. Harder soils will require longer time. (3) Fill shuffle pit with super tropical bleach and earth. (4) Position litters on litter strands in center of shuffle pit.	P / F	P / F	P / F
e.	Treatment section establishes hot line. (1) Establishes hot line thru	P / F	P / F	P / F

	shuffle pit around the waiting area, CBPS, and holding area, and mark with engineer tape or other marking material. (2) Marks hot line within five minutes after shuffle pit is established.			
f.	Treatment section and augmentees establish decontamination and triage areas. (1) Position litters, litter strands, EMT equipment, and required decontamination materials contained in the Chemical Agent Patient Decontamination Set and Chemical Agent Patient Treatment Set. Decontamination Set should be in the vicinity of patient decontamination area. Patient Treatment Set should be with Trauma Treatment Set. (2) Place physical barriers and sentries, if available, around hot line area to maintain security and prevent transfer at other points. (3) Equip contaminated emergency treatment area with selected emergency lifesaving equipment and supplies, including Chemical Agents Casualty Treatment Set. (4) Set up clothing removal area with one pair of litter strands, large plastic bags, extra plastic bags for personal effects and FMCs, two pails or buckets filled with five percent aqueous sodium hypochlorite solution, four pair heavy-duty scissors, gauze or sponges, and M258A1 kits. (5) Establish patient decontamination area with	P / F	P / F	P / F

	one litter on a pair of litter strands. (6) Equip decontamination area with plastic bags, two pails or buckets with five percent sodium hypochlorite solution, gauze or sponges, M258A1 kits, replacement tourniquets and bandages, and M8 detector paper.			
g.	Treatment section and augmentees clean treatment area. (1) Establish clean treatment area inside hot line in front of M51 shelter to side away from generator. (2) Equip treatment area with PPW, medical supplies, and equipment as directed by unit SOP.	P / F	P / F	P / F
h.	Treatment section and augmentees establish patient waiting area. (1) Establish patient waiting area, inside hot line in front of M51 shelter to the side near the generator trailer. (2) Equip with medical supplies, equipment, and PPW for those patients waiting over 10 minutes for entry into M51 shelter.	P / F	P / F	P / F
i.	Treatment section and augmentees establish contamination sump. (1) Establish 75 meters downwind from end of overhead cover for disposition of all contaminated waste. (2) Keep sump separate from contaminated holding area.	P / F	P / F	P / F
j.	Treatment section and augmentees establish contaminated holding area. (1) Establish contaminated holding storage area for recoverable equipment 75 meters downwind. (2) Keep area separate from contaminated sump. (3) Establish contaminated holding area for expectant	P / F	P / F	P / F

	patients near triage area, downwind.			

Instructor Comments:

Nuclear, Biological and Chemical
Appendix D
Establish a Protective Decontamination Shelter &
Priority of treatment and Triage
Skill Sheets

Priority of treatment and Triage

Unit is receiving patients on an integrated battlefield. All personnel with the exception of personnel working in the CPBS are protected as appropriate. Chemical detection and decontamination materials are available outside of the hot line. Select EMT equipment and supplies are available. Assume chemical contamination on all patients.

Some iterations of this task should be performed in MOPP4.

Patients are triaged and prioritized in order of medical priority.

Priority of treatment and Triage
Soldiers Name: _____ SSN: _____ CO: _____ TM: _____
Start: _____ Stop: _____ Initial Evaluator: _____
Start: _____ Stop: _____ Retest Evaluator: _____
Start: _____ Stop: _____ Final Evaluator: _____

		1st	2nd	3rd
a.	Combat medic or treatment section member handles weapons and ordnance. (1) Removes from personnel. (2) Stores and secures weapons and ordnance in a predesignated downwind location.	P / F	P / F	P /
b.	Platoon leader (physician) or PA triages and classifies patients into treatment and decontamination priorities based on signs, symptoms, wounds, or illnesses. (1) Classifies immediate (nonchemical) (a) Classifies patient as immediate when a life-threatening situation exists or is l kely to occur. (b) Begins lifesaving treatment immediately in the contaminated triage or treatment area. (c) Prepares patient for routing into the decontamination line and CBPS. (d) Continues emergency treatment and monitoring of vital signs during decontamination process and in patient waiting area. (2) Classifies immediate (chemical) (a) Classifies patient as chemical immediate when signs and symptoms of severe chemical poisoning are indicated. (b) Identifies agent as established by screening process. (c) Administers appropriate antidotes. (d) Provides assistance with ventilations as required. (e) Provides patient assistance as required	P / F	P / F	P /

		through decontamination line and CBPS.			
	(f)	Provides treatment as required during decontamination.			
(3)	Classifies	minimal (nonchemical)			
	(a)	Classifies patient as minimal when patient has minor wounds or medical symptoms and patient shows no signs or symptoms of chemical agent poisoning.			
	(b)	Directs patient through decontamination lines as patient load situation permits.			
	(c)	Sends patient to holding area outside CBPS after decontamination and treatment are completed.			
(4)	Classifies	minimal (chemical)			
	(a)	Classifies a minimal chemical when patient displays minimal chemical agent positioning symptoms that are controlled with previously given antidotes.			
	(b)	Observes patient for effect or previously administered antidote.			
	(c)	Sends patient to self-decontamination area.			
	(d)	Checks patient's condition during and after decontamination.			
	(e)	Provides further treatment and antidotes as required.			
(5)	Classifies	delayed			
	(a)	Classifies patient as delayed when delay does not interfere with recovery, displays no symptoms after receiving antidote.			
	(b)	Checks patient for chemical agent contaminants and directs through shuffle pit if none are found.			

	(c)	Directs patient through ambulatory line to be decontaminated if contaminants are found and returns to duty if no further treatment is required.			
(6)	Classifies expectant				
	(a)	Classifies patient as expectant when casualty has a severe wound which is complicated with circulatory or respiratory problems and recovery is not expected.			
	(b)	Does not route thru decontamination line.			
	(c)	Places in the contaminated patient holding area.			
	(d)	Reassures patient and provides further treatment as time and tactical situation permits.			

Instructor Comments: